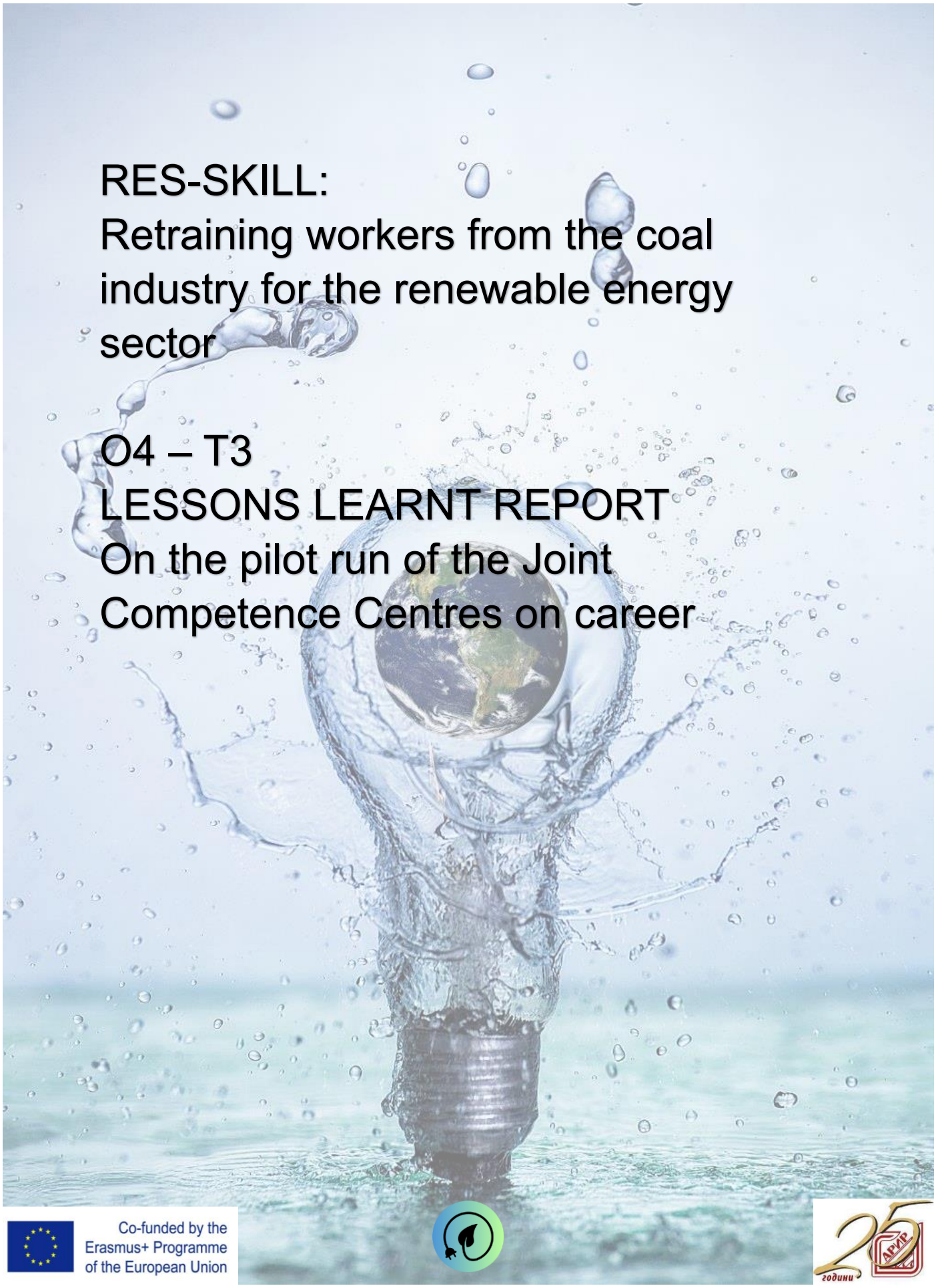

RES-SKILL:
Retraining workers from the coal industry for the renewable energy sector

O4 – T3
LESSONS LEARNT REPORT
On the pilot run of the Joint Competence Centres on career

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

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Contents

ACRONYMS AND ABBREVIATIONS

AES	AES Galabovo Thermal Power Plant
BDB	The Education Directorate for Burgenland
BFI	BFI Burgenland
CCI	Chamber of Commerce and Industry - Stara Zagora
C-VET	Continuous Vocational Education and Training
ECVET	European Credit system for Vocational Education and Training
EMI	Energy Management Institute
EQF	European Qualification Framework
EU	European Union
I-VET	Initial Vocational Education and Training
KPI	Key Performance Indicator
LTT	Liceul Tehnologic Ticleni
MEERI	Institute for Research on Minerals and Energy Economy
OER	Open Educational Resources
PEDDM	Regional Association of Local Governments of Western Macedonia
PROMEA	Hellenic Society for the Promotion of Research and Development Methodologies
RENAC	Renewables Academy
RES	Renewable Energy Sources
RES-SKILL	Reskilling coal industry workers for the renewables energy sector
SZREDA	Stara Zagora Regional Economic Development Agency
VET	Vocational Education and Training

1. Curriculum for initial vocational training by obtaining a qualification in part of the profession

Professional direction	Electrical engineering and energy	Code: 522
Profession	Technician of energy equipment and installations	Code: 522030
Specialty	Renewable energy sources	Code: 5220308
Degree of professional qualification	Third	III
NQR level:	4	
Period of training:	Up to 2 months	
Total hours	48	
which: number of theory hours:	22	
number of practice hours:	26	
Form of education	Living room	
Organizational form	Qualification course	
Entering educational and level	For persons over 16 years of age – acquired right to take state matriculation exams for completion of secondary education or completed secondary education.	

2. Expected learning outcomes

Name of the unit	ERU 10. Assembly and disassembly operations of equipment and installations for RES systems
Learning Outcome 10.1:	Explains the principle of operation and the arrangement of facilities and installations for the production of electrical energy from RES (solar, wind, geothermal and water energy, including energy of sea waves, tides, tides)
Knowledge	• Defines the principle of operation of facilities and installations for the production of electrical energy from RES; • Describes elements of the device of various facilities and installations for the production of electrical energy from RES;

	• It gives examples of facilities and installations for the production of electrical energy from RES.
Skills	• Compares the advantages and disadvantages of facilities for the production of electrical energy from RES; • Connects in a technological sequence the elements of installations for the production of electrical energy from RES.
Competencies	• He is able to independently and faithfully define the need for the application of the most suitable installation for the production of electrical energy from RES
Learning Outcome 10.3:	Assembles/disassembles in accordance with the technical documentation equipment and installations for energy production from RES (wind generators, water turbines, biomass boilers, heat pumps, photovoltaic systems, solar heating installations and hybrid systems)
Knowledge	• Knows the documentation of facilities and installations for energy production from RES (wind generators, water turbines, biomass boilers, heat pumps, photovoltaic systems, solar heating installations and hybrid systems); • Describes assembly/disassembly activities.
Skills	• Selects with the help of directories and catalogs, equipment and installations for RES; • Checks the readiness of the work site; • Coordinates assembly/disassembly activities with the team; • Researches the project documentation of facilities and installations for energy production from RES (wind generators, water turbines, biomass boilers, heat pumps, photovoltaic systems, solar heating installations and hybrid systems).
Competencies	• Able to independently prepare a report on the assembly/disassembly operations performed, including in an electronic version.
Name of the unit	ERU 11. Diagnostics and repair of equipment and installations for the production of electric and thermal energy from RES
Learning Outcome 11.1:	Explains ways to detect and repair faults in RES systems
Knowledge	• Describes the possible damage and defects in equipment and installations for the production of electric and thermal energy from RES; • It explains the causes of defects, damage and deviations from the normal mode of operation.
Skills	• Finds the causes of damage; • Compares the condition of the facility and/or installation with that described in the technical documentation.
Competencies	• Independently or in a team, participates in the safe restoration of the normal operation of the installation and its facilities.

Learning Outcome 11.2:	Performs technical inspection of facilities and installations for energy production from RES (wind generators, water turbines, biomass boilers, heat pumps, photovoltaic systems, solar heating installations and hybrid systems)
Knowledge	• Describes the most common emergency situations; • Describes the signs of emergency situations.
Skills	• Detects defects and damage in a facility or installation visually and/or with equipment; • Complies with the requirements for carrying out a safe and controlled technical inspection of the facilities and installations for the production of energy from RES.
Competencies	• Independently and accurately, motivating his actions, performs the procedures related to the technical review of the installations for the production of energy from RES.
Learning Outcome 11.3:	Organizes repair operations by performing technical control according to technological requirements
Knowledge	• Knows the repair operations at the facilities and at the installations; • Identifies the procedures included in the repair schedule.
Skills	• Distributes the activities in the team; • Controls the technological sequence in the execution of repair operations; • Completes the documentation accompanying the repair.
Competencies	• Professionally and responsibly leads the activities of the team when performing repair and restoration operations.

3. Distribution by types of professional training

no	TYPES OF VOCATIONAL TRAINING, COURSES/MODULES	Number of study hours
	SECTION A: COMPULSORY STUDY HOURS	48
	THEORETICAL TRAINING	22
Section A1. General professional training		
	Total number of study hours for section A1:	0
Section A2. Industry professional training		
	Total number of study hours for section A2:	0
Section A3. Specific professional training		
1.	Planning, installation and maintenance of photovoltaic equipment and installations.	22
	Total number of study hours per sectionA3:	22
	Total number of study hours	22

	on theoretical training for section A2 + section A3:	
	PRACTICAL EDUCATION	26
Section A2. Industry professional training		
1.	Educational practice in:	
	Total number of study hours for section A2:	0
Section A3. Specific professional training		
1.	Educational practice in:	
1.1	-Installation and maintenance of photovoltaic equipment and installations.	26
	Total number of study hours for section A3:	26
	Total number of teaching hours for practical training for section A2 + section AZ:	26
	SECTION B. ELECTIVE COURSES	0
	ADVANCED VOCATIONAL TRAINING	
	Total number of elective hours per sectionB:	0
	Total number of compulsory and optional study hours for section A + section B	48

4. Organization of the training

The theoretical classes are held in specialized classrooms, and the practical classes are held in the educational and production bases of the branches and in enterprises with which the training organization is in partnership.

Classes are held according to a pre-prepared schedule, which lists the start and end time of the classes, the breaks between classes, the subjects studied and the teachers in the course.

The organization of training is in modules. Each module covers a specific area / system of the car, applying an integrative learning approach within the module of theory and learning practice.

Specific teaching methods

The teachers plan, select and use the appropriate methods, means, materials and educational tools to implement the training in the relevant subject/module. A variety of teaching methods can be used: presentations, lectures, role-plays, solving cases, discussions, working in groups, etc. Practical classes are based on the "Learning by experience" approach, practical tasks, case studies, etc.

Verification and evaluation methods

Ongoing evaluation of the acquired knowledge and skills - oral, written, practical tasks, with the evaluation criteria defined and disclosed in advance.

5. Training program

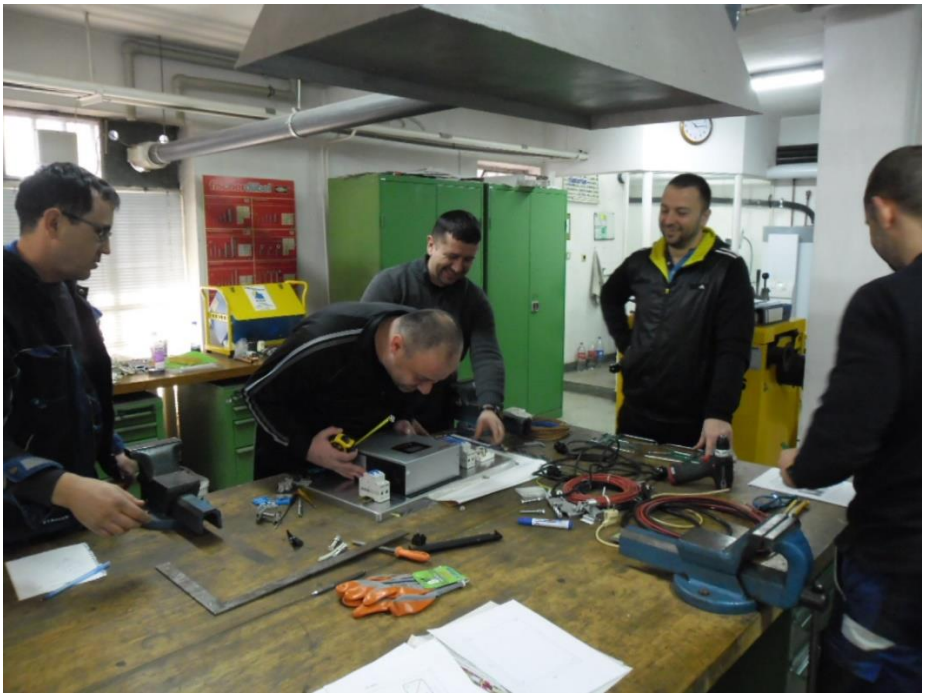
no	NAME OF THE TEACHERS SUBJECTS/MODULES	Number of theory hours	Number hours practice
A.	COMPULSORY STUDY HOURS	48	
	THEORETICAL TRAINING	22	-
A1.	GENERAL VOCATIONAL TRAINING	0	-
A2.	INDUSTRY PROFESSIONAL TRAINING	0	-
A3.	SPECIFIC PROFESSIONAL TRAINING	22	-
1.	Planning, installation and maintenance of photovoltaic equipment and installations.	22	-
	Basic principles of plant planning: determining the optimal location, legal requirements, regulations, guidelines, standards and rights, principles of operation, electronic and mechanical components.	7	-
	Principles of installation of a small photovoltaic plant: the specific tools and techniques of installation, work steps during commissioning, reception-transmission protocol, technical documentation, etc.	8	-
	Operation and maintenance of the photovoltaic plant: protocols, measuring equipment and safety equipment.	7	-
	PRACTICAL EDUCATION		
A2.	INDUSTRY PROFESSIONAL TRAINING	-	-
A3.	Specific professional training	-	26
1.	Educational practice in:		
1.1	Installation and maintenance of photovoltaic equipment and installations.	-	26
	Determining the optimal location.	-	6
	Assembly/dismantling of equipment and installations of a small photovoltaic plant. Use of the specific tools and assembly/disassembly techniques. Completion of the transmission protocol and technical documentation.	-	10
	PV plant maintenance activities. Conducting measurements.	-	10

6. Conclusions drawn after the training

Nr.	Author	Conclusion
1	Trainee in the pilot run	For stronger motivation of the trainees there must be a valid certificate at the end of the course.
2	Trainee in the pilot run	For better logistics a good balance in the time schedule of the training course should be considered.

3	Trainee in the pilot run	There is a need for more practice.
4	Trainer	It was recommended to plan a longer training course – at least about 72 hours.
5	Trainer	For a smoother conduction of the training a similar profession of the trainees was recommended.
6	Trainer	For a smoother conduction of the training a similar level of education of the trainees was recommended.
7	Trainer	The developed materials are well developed, but need fine tuning on a country level in accordance with country-specific issues.
8	Trainer	The optimal group of trainees is about 8-10 people in total.
9	Training organizer (VET center)	In the preparation phase of the training there should be a careful selection procedure of the trainees.
10	Training organizer (VET center)	For the purposes of better communication there should be a marketing campaign before announcing a training
11	Training organizer (VET center)	The elaborated resources should be coordinated with the Ministry of Education.
12	SZ REDA	When inviting participants for the training course it should be coordinated with their employer.
13	SZ REDA	A detailed planning of the training and careful selection procedure of the trainees.
14	SZ REDA	Elaboration of a coordination protocol on the axis Training Initiator → VET provider → Trainer → Trainees → Trainees' employer

7. Pictures from the pilot run of the Joint Competence Center for Career Reorientation

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