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GRINSCO
GREEN INSULATION SKILLS
FOR CONSTRUCTION WORKERS



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GRINSCO

Green Insulation Skills for Construction Workers

R2-T1 REPORT

CLUSTERING OF LEARNING OUTCOMES INTO GRINSCO LEARNING UNITS AND CURRICULUM DESIGN

ERASMUS+ Programme



Project Code:

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Introduction

ABOUT THE PROJECT:

Green insulation materials offer several advantages over traditional insulation, including a lower environmental impact, reduced carbon emissions, and lower life cycle costs. Despite these benefits, the mainstream construction sector has not widely adopted these materials due to a lack of skills and training among construction workers. This skills deficit has been exacerbated by the rapid transition to sustainable construction methods, which are evolving faster than education and training systems can adapt. Additionally, the shortage of insulation workers with knowledge of green insulation techniques is a significant obstacle to implementing EU and national strategies aimed at reducing greenhouse gas emissions and addressing environmental concerns, such as the EU Green Deal. It is essential to provide work-based learning opportunities for construction workers to develop green insulation skills, improve employability, and increase pay, while meeting the demand for sustainable solutions in the construction and renovation sector. This project addresses the need for upskilling resources in sustainable insulation and equips VET providers with relevant resources to develop appropriate training offerings. The consortium has been assembled to address the skills deficit and ensure that all European VET providers have access to suitable resources.

Objectives:

GRINSCO forms a Cooperation Partnership to improve work-based learning VET, by developing and making available educational resources. Its main objective is to address current and emerging occupational skills needs and to enable VET providers to adapt offerings in novel insulation techniques and boost construction workers' skills and employability in a rapidly evolving labour market.

Specific objectives:



To fully address the skills deficit and meet the demand for green insulation skills in the construction sector, it is necessary to enrich the mapping of skills requirements and construction sector needs. An evidence-based curriculum and training content must be designed to meet these requirements, and this must be embedded into existing formal and non-formal training provision. To achieve this, work-based learning (WBL) educational resources will be developed, including teaching materials and guidelines, to support VET providers in integrating green insulation techniques into their WBL and apprenticeship offerings. Furthermore, it is essential to foster the recognition and integration of relevant occupational requirements into certification schemes to ensure that workers with green insulation skills receive the recognition they deserve. By taking these steps, the project will contribute to improving employability, increasing pay, and meeting the demand for sustainable solutions in the construction and renovation sector.

Implementation:

- Analysis of current and future skills and knowledge needs leading to the development of learning outcomes.
- Development of a curriculum on green insulation applications.
- Creation of corresponding pedagogical materials to be offered as Open Education Resources.
- Development, testing, and delivery of Online Training Scenarios on green insulation in construction, promoting innovative and flexible practices in VET.
- Sharing of results with multiplier events, inviting target groups to uptake GRINSCO results and to act as further multipliers.

For more information about the project, please visit its official website:

www.grinsco.eu



R2 - GRNISCO learning units and Open Educational Resources (OERs)

APPROACH:

This outcome encompasses the creation of a modular syllabus for Work-Based Learning (WBL) that can be utilized by vocational education and training (VET) providers and employers in order to teach green insulation skills to learners and workers in the construction industry. Each module will have its own unique learning objectives, which are described in R1-T4 and consist of knowledge, skills, and competencies that can be evaluated in a consistent and coherent manner.

Additionally, this outcome entails the development of educational resources for WBL that complement the syllabus, including instructional materials, teaching aids, and assessment tools, all of which are intended to support the delivery of the construction industry education and training program.

The Open Educational Resources (OERs) being developed as part of the GRINSCO project will be based on the first result (R1) and will be freely available for use by third parties. The primary objective of these materials is to provide construction sector providers and companies with access to green insulation skills through a collection of educational resources, which will allow them to stay up to date with the latest developments and trends in the industry.

METHODOLOGY:

This deliverable consists of three consecutive steps. The initial task involves the creation of a curriculum overview that defines up to five learning units, or modules, based on the identification of work requirements and an elaboration of the learning outcomes outlined in the first result. The partnership will develop open educational resources that align with the analysis of occupational training requirements, including case studies and exercises designed to simulate real-world job-specific tasks that require green insulation skills in the construction sector.

INNOVATION, EXPECTED IMPACT & TRANSFERABILITY POTENTIAL:

The outcome of this project will establish the framework for a new training and skill enhancement program focused on environmentally-friendly insulation methods. The program will offer contemporary modules that can be incorporated into current work-based learning schemes in the construction industry. The GRINSCO curriculum will encompass all the necessary skills and competencies required by both current and future employees in the construction sector to effectively utilize green insulation materials. Furthermore, the educational materials developed by GRINSCO will be accessible for duplication, adaptation, and utilization by any educational institution or construction industry employer who provides work-based training. They will also be available for self-directed learning to interested professionals in the construction sector, employees in industries with similar workplace demands (such as manufacturing), or individuals seeking to improve their knowledge and skills in green insulation techniques.

Clustering of learning outcomes into GRINSCO learning units

The project includes the development of 4-5 units based on the defined learning outcomes, in accordance with the guidelines set by the European ECVET network. To group the learning outcomes into units, the partnership will consider criteria such as their relevance to a particular set of occupational tasks, specific stages in the process of performing a task, or a common area of skills. Each unit will address a unique set of knowledge, skills, and competencies, and will be thematically focused on the following work practices.

Furthermore, this assignment involves creating specifications for each learning unit that encompass both practical and theoretical pedagogical approaches. This includes determining: a) the duration of each unit, b) the weighting of the defined learning outcomes to current and/or future construction sector qualifications, c) the teaching and learning methods/activities, d) the required study resources, and e) the evaluation criteria.



ECVET Framework

The European Parliament and the Council of the EU adopted the ECVET recommendation in 2009 and invited Member States to create the necessary conditions and adopt measures to apply the system to all VET qualifications. External evaluation of ECVET implementation was carried out in 2013.

The European Credit Transfer System for Vocational Education and Training (ECVET) is a technical framework for the transfer, recognition and, where appropriate, accumulation of individuals' learning outcomes with a view to achieving a qualification. ECVET is intended to facilitate the recognition of learning outcomes in accordance with national legislation, in the framework of mobility, for the purpose of achieving a qualification.

ECVET is based on the division of qualifications into units and on the description of learning outcomes of each unit using the three descriptors of EQF; knowledge, skills, and competences, making clear the EQF level of reference.

Qualifications and units are represented by a specific number of credit points. Credit points express the volume of learning outcomes in each unit and provide information on the relative weight of the units which make up a qualification.

Assessment, validation and recognition processes must also be agreed among all those participating and should respect existing national, regional, sectoral or institutional practice. ECVET is not intended to replace national qualification systems, but to provide a greater degree of comparability and compatibility between them.

ECVET applies to all the results obtained by an individual in the different education and learning systems which are transferred, recognised and aggregated in order to provide a qualification. This initiative makes it easier for European Union (EU) citizens to have their education, skills and knowledge recognised in an EU country other than their own. ECVET complements the European Credit Transfer and Accumulation System (ECTS), establishing a link between Vocational Education and Training and Higher Education.

Main objectives of ECVET framework are:



- Facilitate the validation and recognition of professional skills and knowledge acquired in different systems and countries so that stakeholders can appropriately include them in their professional qualifications curricula.
- Enhance the attractiveness of mobility between different countries and educational environments.
- Increase the compatibility between different European vocational education and training systems and the qualifications they provide.
- Increase the employability of vocational training graduates and the confidence of employers that each VET qualification requires specific skills and knowledge.

What is a learning unit?

Learning unit is a training element that responds to a series of learning outcomes, defined in terms of knowledge, skills and competences which can be evaluated, validated and certified. Units enable progressive achievement through transfer and accumulation of learning outcomes defined in knowledge, skills and competence terms. Units of learning outcomes can be specific to a single qualification or common to several qualifications and may also describe so-called additional qualifications which are not part of a formal qualification or curriculum. Learning units enable progressive achievement through transfer and accumulation of learning outcomes. They define evidence-based Learning Outcomes and are subject to assessment and validation which verify whether the learner has achieved the learning outcomes expected.

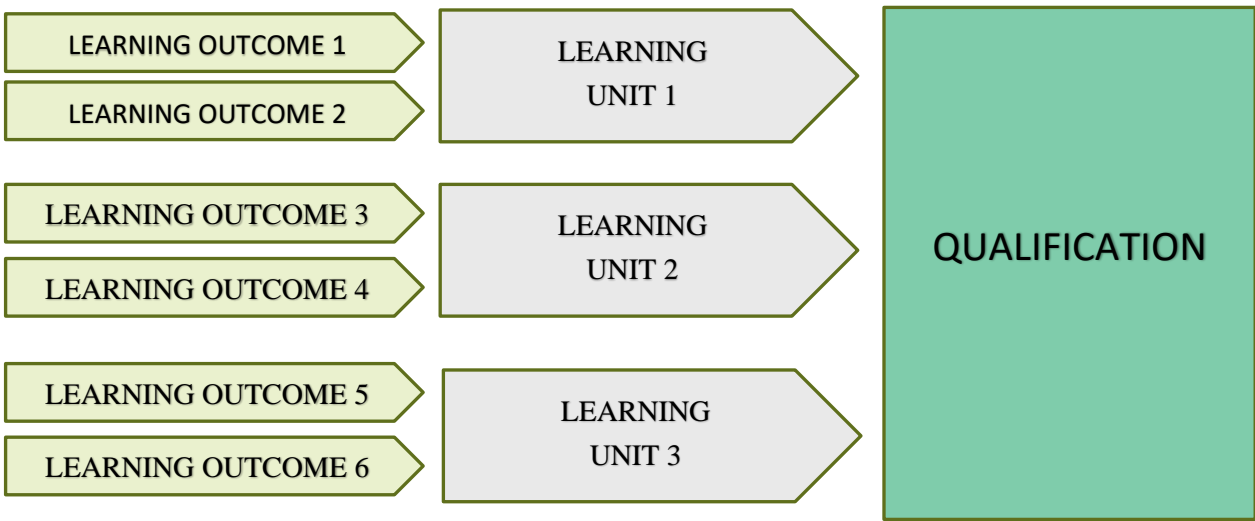


Figure 1. Diagram of ECVET qualification

Grouping Learning Outcomes into Learning Units

The design of learning units for any course is dependent on the teaching practices, learning arrangements and assessment methods envisaged for its delivery. GRINSCO units will each correspond to unique sets of knowledge, skills and competences, which will thematically address various aspects of skills relevant to green insulation materials.

The approach adopted for designing the GRINSCO learning units follows the shift to competence and career-oriented education and training, in alignment with the results obtained in the first Result (R1) of the project. The process followed, in compliance with the provisions of the project's Application Form, has been to group and sequence learning outcomes logically in learning units, resulting in individual units that learners can select as being most relevant to their needs.

As it is suggested by the European principles, learning units will also respond to the following characteristics:

- Units of learning outcomes can be completed and assessed, as independently as possible from other units of learning outcomes.
- Units of learning outcomes are structured in such a way that the relevant learning outcomes can be achieved in a specific time interval. Units of learning outcomes should therefore not be too extensive.



- Units of learning outcomes include all necessary learning outcomes in order to cover the objectives of the units.
- Units of learning outcomes are designed to be assessable.

Based on the specific requirements and objectives of the GRINSCO Project partnership also listed a set of grouping criteria that have been taken into consideration alongside the European grouping criteria:

- The learning units should cover the same sets of occupational tasks.
- The learning units should cover specific stages of the process.
- The learning units should cover the same field of skills.

Based on the above criteria and the objectives of the project, the partnership came up with the following groupings of learning outcomes into learning units.



Learning Unit 1: Knowledge of the qualities of green insulation materials in construction

The first learning unit covers learning outcomes related to basic knowledge of green materials and their technical properties. During this learning unit, the learner will learn to classify different insulation materials and understand the necessity of using green materials. In addition to all this, they will be able to independently make assessment of the product, will know the most important ecological labels and will have basic knowledge about the physical properties of buildings.

LEARNING UNIT 1	KNOWLEDGE OF THE QUALITIES OF GREEN INSULATION MATERIALS IN CONSTRUCTION		
EQF LEVEL 4	EXPECTED LEARNING OUTCOMES		
	KNOWLEDGE	SKILLS	COMPETENCES
	Knows / Aware of: <ul style="list-style-type: none"> • ecological relevance and technical properties of materials and systems • how to classify insulations • the necessity of using green materials • basic concepts of building physics • most important ecological labels 	Be able to: <ul style="list-style-type: none"> • to perform a product assessment • perform works properly using green insulation materials • identify proper insulation material for the given work 	Be able to: <ul style="list-style-type: none"> • account for own and others actions in ensuring that the application is correctly integrated within a complex environment and complies with user/customer needs in terms of selecting proper green insulation materials



Learning Unit 2: Application of green insulation materials in different construction structures

The second learning unit covers the learning outcomes for correct insulation installation. Learners will learn how to properly measure thermal insulation materials and at the same time properly manage the generated waste. They will learn to read construction drawings and perform work according to them. Also, properly select the amount and type of insulation taking into account the installation location or other parameters. In addition to all this, learners will be able to perform a quality assessment after the completion of the insulation installation work. This learning unit also covers health and safety requirements.

LEARNING OUTCOME 2	APPLICATION OF GREEN INSULATION MATERIALS IN DIFFERENT CONSTRUCTION STRUCTURES		
EQF LEVEL 4	EXPECTED LEARNING OUTCOMES		
	KNOWLEDGE	SKILLS	COMPETENCES
	<p>Knows / Aware of:</p> <ul style="list-style-type: none"> • how to apply thermal insulation composite systems or other systems • health and safety requirements • differences in construction structures and climate differences in various regions of the EU • differences in availability of green insulation materials in various countries 	<p>Be able to:</p> <ul style="list-style-type: none"> • read and comprehend construction plans/ blueprints • determine amounts and types of insulation needed, based on factors such as location, surface shape and equipment use, energy efficiency etc. 	<p>Be able to:</p> <ul style="list-style-type: none"> • measure and cut insulation materials to adhere to specifications • perform quality assurance on site after finalized installation • execute installation of green insulation materials • manage construction waste created during insulation works (hazardous materials, sorting, utilization etc.)



Learning Unit 3: Maintenance of green insulation materials

The third learning unit covers such learning outcomes that are intended to provide knowledge and skills for the maintenance of already installed green insulation or its systems. Learners will learn the basic differences between routine and non-routine care and be able to perform this care. Will be able to perform an assessment of installed insulation systems. Will have knowledge of various surface textures and renovation techniques and will be able to prepare material and cost calculations.

LEARNING OUTCOME 3	MAINTENANCE OF GREEN INSULATION MATERIALS		
EQF LEVEL 4	EXPECTED LEARNING OUTCOMES		
	KNOWLEDGE	SKILLS	COMPETENCES
	Knows / Aware of: <ul style="list-style-type: none"> • influence of weather conditions on insulations • difference between ordinary and extraordinary maintenance • about different surface textures and renovation techniques • about ordinary and extraordinary maintenance – how to do it • how to prepare cost calculation 	Be able to: <ul style="list-style-type: none"> • make use of knowledge about life-cycle of systems and buildings • to prepare calculations of materials, work, equipment 	Be able to: <ul style="list-style-type: none"> • perform an assessment and diagnosis of the installed system • perform a proper maintenance of green insulation materials and facades • perform regular works, like cleaning or fixing green insulation elements in buildings and structures.



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Learning Unit 4: Sustainability objectives and considerations, soft skills, communication, job opportunities, professional development

The final learning unit is designed to develop soft skills in a wider context and to provide basic knowledge about the circular economy. The learner will learn to communicate effectively with other participants in the construction/insulation process and to present/promote the advantages of the green insulation materials used. Also, this learning unit will focus on professional development and its importance.

LEARNING OUTCOME 4	SUSTAINABILITY OBJECTIVES AND CONSIDERATIONS, SOFT SKILLS, COMMUNICATION, JOB OPPORTUNITIES, PROFESSIONAL DEVELOPMENT		
EQF LEVEL 4	EXPECTED LEARNING OUTCOMES		
	KNOWLEDGE	SKILLS	COMPETENCES
	Knows / Aware of: <ul style="list-style-type: none"> importance of professional development and motivation for upskilling and improving competence to keep people competitive on job market importance of soft skills meaning at work and how they influence communication and overall performance of work 	Be able to: <ul style="list-style-type: none"> recognize benefits of personal development understand ethos of being a construction professional and act according in on a day-to-day basis at work put in practice the circular economy concept at work 	Be able to: <ul style="list-style-type: none"> to interact and communicate with owner about eco-friendly products being installed and discuss benefits communicate effectively with construction manager/ engineer/ site managers/ foreman/ owner highlight the advantages of green materials



Learning units specifications

Specifications of the learning units define the scope and essential requirements to be met by the corresponding training programme. Based on the definition of the course specifications, it will be developed the training course materials.

The definition of the learning units' specifications is based on ECVET principles, which denote that each unit may include the following elements:

- EQF level of qualification;
- Recommended knowledge;
- Duration of learning process;
- Weighting of learning units;
- Credits allocation;
- Prerequisites to attend each learning unit;
- Training content;
- Assessment methods.

Based on ECVET principles, duration of a course is counted by accumulating the following:

- **Contact hours (Theoretical training):** the amount of expected timetabled hours of teacher-student contact, including lectures, tutorials, seminars and workshops for delivering the theoretical part.
- **Self-study hours (Individual work):** the study of something by oneself without direct supervision or attendance in a class.
- **Hands-on hours (Practical training):** practical sessions which can also be supervised. Also it includes Site-visits, which may be organised altogether or may be carried out individually.
- **Assessment hours:** the time needed to prepare an assignment, including the time allocated to the exam.

The project partners decided that the duration of all learning unit is 25 hours, so the total training duration of the GRINSCO course will be 100 hours. The duration of each learning unit should not

be considered rigidly defined, but rather as a recommended indicator for each learning unit to allow for flexible integration with existing vocational training courses.

To enable a common approach for the application of ECVET credits, a convention is used according to which 60 credit points are allocated to the learning outcomes expected to be achieved in a year of formal full time VET. Consequently, one ECVET credit point equates to the learning outcomes achieved through average of 25 learning hours. Thus, total recommended time for this course of 100 learning hours, corresponds to 4 ECTS credits.

Specifically, for this course, the following hours have been defined for each learning unit as follows:

- Learning Unit 1: 8 contact hours, 6 hands-on hours, 9 self-study hours, 2 assessment hours (assignment);
- Learning Unit 2: 8 contact hours, 8 hands-on hours, 7 self-study hours, 2 assessment hours (assignment);
- Learning Unit 3: 8 contact hours, 8 hands-on hours, 7 self-study hours, 2 assessment hours (assignment);
- Learning Unit 4: 9 contact hours, 8 hands-on hours, 6 self-study hours, 2 assessment hours (assignment);

In total, GRINSCO educational materials will include the following learning hours associated with each learning unit in order to define the duration of the whole course as follows:

	Hours				Total ours of the unit
	Contact	Practice training	Self-study	Assessment	
Learning unit 1	8	6	9	2	25
Learning unit 2	8	8	7	2	25
Learning unit 3	8	8	7	2	25
Learning unit 4	9	8	6	2	25
Sub Total:	33	30	29	8	
				Total:	100



Course description

Title	Green Insulation Skills for Construction Workers
Description	The course is addressed to workers/ technicians in construction companies who need upskilling their green insulation skills through work-based learning VET. Learners will get/improve their knowledge and skills in field of installation and maintenance of green insulation. The course will also allow workers/ technicians to improve their skill in circular economy and soft skills.
EQF level	4
Duration	100 hours. The structure of the course is organised in four different learning units: <ul style="list-style-type: none"> • Knowledge of the qualities of green insulation materials in construction (1 credit). • Application of green insulation materials in different construction structures (1 credit). • Maintenance of green insulation materials (1 credit). • Sustainability objectives and considerations, soft skills, communication, job opportunities, professional development (1 credit).
ECVET credits	4
General prerequisites	One of the following: <ul style="list-style-type: none"> • VET Certificate, equal to or greater than EQF level 3 • 1 or more years of proven experience in building insulation.
Evaluation	Evaluation will consist on 50 multiple choice questions test and 5 case studies.
Method	



Learning Unit 1: Knowledge of the qualities of green insulation materials in construction

Title	Knowledge of the qualities of green insulation materials in construction
Description	This learning unit introduces the learner to different types of green insulation materials and their properties. It also provides knowledge about product assessment and ecological labelling. In addition, the main physical properties of the buildings are described.
Overall learning outcome	Learner should know how to classify different types of green materials, should understand product labels and their descriptions, should understand building physics. Learner should prepare product assessment independently.
Recommended knowledge	General knowledge of buildings and insulation materials.
EQF level	4
Duration in Hours	25 hours.
ECVET credits	1
Prerequisites	General
Training content	To be completed once training material is developed
Assessment	One assignment: case-study Evaluation test: 10 open-ended questions and/or multiple choice test



Learning Unit 2: Application of green insulation materials in different construction structures

Title	Application of green insulation materials in different construction structures
Description	This learning unit introduces to installation of different types of green materials on the different types of surfaces. The learner is introduced to all operations: starting from drawing readings, preparation of materials and ending with the final quality assessment.
Overall learning outcome	Learner should know how to apply different types of green materials or their systems. Should know all health and safety requirements. Be able to measure and cut insulation materials and determine amounts and types of insulation needed. Should know the principles of waste management.
Recommended knowledge	Construction fundamentals
EQF level	4
Duration in Hours	25 hours.
ECVET credits	1
Prerequisites	General + Learning unit 1
Training content	To be completed once training material is developed
Assessment	One assignment: case-study Evaluation test: 10 open-ended questions and/or multiple choice test



Learning Unit 3: Maintenance of green insulation materials

Title	Maintenance of green insulation materials
Description	This learning unit corresponds to maintenance of already installed green materials. It presents different surfaces and techniques used to renovate them.
Overall learning outcome	Learner should understand influence of weather conditions on insulations. Should understand differences between ordinary and extraordinary maintenance and know how to perform them. Learner should know how to prepare cost calculations.
Recommended knowledge	Building maintenance fundamentals
EQF level	4
Duration in Hours	25 hours.
ECVET credits	1
Prerequisites	General + Learning unit 1 + Learning unit 2
Training content	To be completed once training material is developed
Assessment	One assignment: case-study Evaluation test: 10 open-ended questions and/or multiple choice test

Learning Unit 4: Sustainability objectives and considerations, soft skills, communication, job opportunities, professional development

Title	Sustainability objectives and considerations, soft skills, communication, job opportunities, professional development
Description	Last learning unit is focused to the communication among participants of construction/insulation process, professional development and values of circular economy.
Overall learning outcome	Learner should know basic principles of circular economy. Learner should understand importance and need of professional development and motivation for upskilling. Learner should be able effectively communicate with other participants of construction process and promote benefits of green materials.
Recomended knowledge	Fundamentals of circular economy and communication
EQF level	4
Duration in Hours	25 hours.
ECVET credits	1
Prerequisites	General
Training content	To be completed once training material is developed
Assessment	One assignment: case-study Evaluation test: 10 open-ended questions and/or multiple choice test