[Erasmus+ KA220 GS4VET project “Green Skills for VET” 2023-1-IT01-KA220-VET-000150559]

GREEN SKILLS FOR VET

GUIDELINES FOR WORK PACKAGES

(OER)

Environmental sustainability as a learning challenge

GS4VET website: https://www.greenskills4vet.com/

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Glossary of acronyms

BP: Business Partner
HR: Human Resources
IFP: Synonym for VET (Vocational Education and Training)
LTO: Italian acronym for Local Laboratories for Employability
MdL: Italian acronym for Labor Market
LM: Labor Market
OE: Original Equipment
OER: Open Educational Resources
PCTO: Italian acronym for Pathways for Transversal Skills and Orientation
PLC: Programmable Logic Controller
STEM: Science, Technology, Engineering, Mathematics
STEAM: Science, Technology, Engineering, Arts, and Mathematics
VET: Vocational Education and Training
VETP: VET Provider
WP: Work Package
WBL: Work-based learning

This version of the text is numbered =01= and has been:

Reviewed by the project Partners, WP2. **(Date)** _____

Reviewed by the project Partners, WP3. **(Date)** _____

Reviewed by the project Partners, WP4. **(Date)** _____

Approved by the Erasmus+ KA220 GS4VET project "Green Skills for VET" 2023-1-IT01-KA220-VET-000150559 Partnership for review by its individual members on

(Date) _____

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Project summary sheet

Field: Vocational Education and Training
Project Title: Green Skills 4 VET
Start Date: 02/11/2023
End Date: 01/11/2025

Partners:

VET:
CISITA PARMA scarl (Italy)
Istituto Istruzione Superiore "C. E. Gadda" (Italy)
EPAQL - Escola Profissional Agrícola Quinta da Lageosa (Portugal)
SIC - Strokovni izobrazevalni center Ljubljana (Slovenia)
SCP - Skola za cestovni promet Zagreb (Croatia)

Companies:

AAPIM - Associação de Agricultores para Produção Integrada de Frutos de Montanha (Portugal)
Frigomeccanica SpA (Italy)
DOLEJŠI MODNI GUMBI (Slovenia)
Tokić (Croatia)

PROSPEKTIKER, Instituto Europeo de Prospectiva y Estrategia SA (Spain)

Work packages titles:

WP 1 Project Management.
WP 2 Case studies on environmental sustainability in production and design of educational cases.
WP 3 Design, testing, validation, and release as OER of educational programs on environmental sustainability at the single-sector level.
WP 4 Design, testing, validation, and release as OER of educational programs on environmental sustainability at the inter-sectoral and cross-sectoral levels.
WP 5 Multiplier events.

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Project summary:

Priorities:

HORIZONTAL:
Environment and fight against climate change
Inclusion and diversity in all fields of education, training, youth and sport

VET: Adapting vocational education and training to labour market needs

Objectives:

- Transfer environmental sustainability challenges and solutions/methods from the industrial setting to the VET field;
- Develop green skills in VET educators and learners;
- Innovate VET curricula to align with labor market demand;
- Introduce environmental sustainability into VET through work-based and problem-based learning programs;
- Develop inclusive learning methods to engage disadvantaged learners at risk of educational failure.

Implementation:

WP 1: Project management and dissemination.
WP 2: Sector studies on environmental sustainability in production; company testimonial pathways in VET.
WP 3 e **WP 4**: Design educational programs using flipped classroom methods, with work-based testing for sustainability skills at single-sector (**WP 3**) and inter-cross-sectoral levels (**WP 4**).
WP 5: Multiplier events for results dissemination (1 in Portugal, 1 in Italy, 1 in Slovenia, 1 in Croatia, 1 in Spain).

Results:

WP 2 Design of case studies on relevant environmental sustainability issues in production.
WP 3 e **WP 4**: Educational programs designed, tested, validated, and released as OER for integrating environmental sustainability into the VET curriculum at the single-sector level (**WP 3**) and inter-sectoral and cross-sectoral levels (WP 4);
WP 5 n° 5 Multiplier events for project results dissemination.

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Intellectual outcomes:

WP 2: A set of multilingual guidelines in OER format (in English and all partnership languages) for modeling case studies on environmental sustainability and designing educational and training cases applicable to other educational and/or production sectors.

WP 3: Multilingual OER guidelines for the design, testing, and validation of single-sector environmental sustainability educational and training cases, aimed at facilitating the replicability of the approach for future and potential beneficiaries.

WP 4: Multilingual OER guidelines (in English and all partnership languages) for the design, testing, and validation of cross-sectoral environmental sustainability educational and training cases, aimed at facilitating the replicability of the approach for future and potential beneficiaries.

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Project description:

The project aims to update/innovate VET training offerings to better meet the current demand for Green Skills expressed by the economic and production system in order to address the sustainable development challenges outlined in all programmatic documents. Addressing environmental impact and global warming is a top priority for the EU Agenda 2021-2027, as a result of the 2015 Paris Agreement on climate change, the latest COP 27 Conference in Egypt in 2022, the UN Agenda 2030 Sustainable Development Goals, the European Green Deal, and the Recovery Plan for Europe. The primary goal is to achieve carbon neutrality in Europe by 2050, limiting the rise in global warming, further massive damage to the planet, and consequently to the human species. A key role will be played by the economic and production system, particularly by the most energy-intensive and/or environmentally impactful industries, which produce excessive pollution. Reducing industrial pollution and changing the energy model will be crucial actions to meet the stated environmental goals.
The project is motivated by this context. The VET system is the ideal setting for initiating educational projects on the environment, sustainability, and global citizenship. To promote sustainability education, the 2030 Agenda has established Goal 4: 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all', and Target 4.7: 'Ensure that all learners acquire the knowledge and skills needed to promote sustainable development by 2030, including through education for sustainable development and sustainable lifestyles, and global citizenship'. Additionally, 2023 is the European Year of Skills, a community initiative aimed at promoting the development of professional skills to ensure quality job opportunities for individuals, especially the future workforce, and to support companies in enhancing the competitiveness of the European economic system.
The new EU Agenda for Skills for Employment recommends developing knowledge and capabilities in individuals, especially youth, to address the dual green and digital transition, enabling them to become active drivers of change. Raising awareness among young people about the causes of pollution and climate change, the issues affecting the economic and industrial system, and teaching them, through innovative learning methods, respect for the environment, resource conservation, and solutions for more sustainable industrial development, is essential for shaping future workers who can support the production system in its green transition processes.

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Project objectives:

In line with the selected priorities, the project pursues the following **general objectives**.

Priority 'Environment and Climate Change Mitigation' and 'Align VET with Labor Market Needs':

a) Transfer real environmental sustainability issues and challenges from the industrial and business setting to the VET field, to integrate the School-Business pipeline and align supply and demand logic;
b) Develop and/or enhance environmental sustainability skills in VET educators and learners;
c) Innovate VET curricula to better align with labor market needs in their respective sectors;
d) Introduce environmental sustainability as a standalone subject in the VET curriculum or as an interdisciplinary topic through new work-based and problem-based learning programs built from real business scenarios;

Priority: 'Inclusion and Diversity':

e) Develop inclusive, learner-centered methods at the VET level to engage and motivate students with disabilities, low achievement, cultural or linguistic barriers, and those at risk of dropping out of their educational or training programs.

These general objectives are articulated into **specific objectives**, which define the aims of the activities carried out within the project (Work Packages):

WP 2: Familiarize VET educators and learners with real and concrete environmental sustainability issues related to the manufacturing sector, promoting dialogue and exchange between VET and Companies;

WP 3: Develop innovative and inclusive educational programs on environmental sustainability specifically tailored to high-impact production sectors, to incorporate this as a competency in the VET curriculum at the **single-sector level**.
Educational programs incorporating work-based and problem-based activities, delivered using the Flipped Classroom methodology, aimed at promoting the inclusion of weaker students by reversing traditional lecture-based teaching methods;

WP 4: Develop innovative and inclusive educational programs on environmental sustainability applicable across all production sectors, to integrate this as a competency in the VET curriculum at the **inter**- and **cross-sectoral levels**.
Educational programs incorporating work-based and problem-based activities, delivered using the Flipped Classroom approach.

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Target groups:

1) VET System:
- VET learners: Students from VET Provider partners (EPAQL Portugal, GADDA Italy, SICLJ Slovenia, SCP Croatia). It is expected to involve 20 learners per VET partner, totaling 80 learners, of whom approximately 20% have low academic performance, high absenteeism, linguistic or socio-cultural disadvantages, or disabilities and special educational needs. They will be the recipients of company testimonials and the key participants in the testing phases of sustainability educational programs.
- VET teachers/staff: Subject teachers or training experts involved in curriculum design. They benefit from company testimonials and co-develop sustainability educational programs with the business sector. They supervise learners during program testing phases and participate in result evaluation activities for final validation
- VET researcher from APPLICANT (Cisita): Methodology experts in teaching and learning processes, responsible for validating and accrediting the programs.

2) Business System, consisting of managers or technical experts from partners (AAPIM, Frigomeccanica, Dolejši, Tokić), with expertise in environmental sustainability. They provide company testimonials and co-design sustainability educational programs with VET Teachers. Following program trials, they assess the specific impact of the solutions developed by learners in the case studies.

3) Specialist Consulting System (Prospektiker), represented by experts in environmental sustainability and strategic business development (at least 1 expert). After the program trials, they assess the potential impact of the identified sustainability solutions, including the level of sustainability achieved, feasibility, and scalability. They are also responsible for dissemination.

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Summary

Introduction

Note: This summary is currently provisional and will be progressively updated with the modeling of subsequent WP3 and WP4, along with the addition of further chapters.

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1. Guidelines Target Audience

These guidelines pertain to the first of three steps (p. 5, Intellectual Outcomes) and are designed to model the process in the VET context for:

- Acquisition

- Management with innovative teaching methods

- Testing/case solving

of concrete sustainability challenges presented by companies in specific high-impact industrial sectors. These guidelines are primarily aimed at educators and trainers who wish to experiment with and introduce innovative and inclusive educational programs related to environmental sustainability within the VET system, based on the Challenge Learning approach through Flipped Classroom.

The following guidelines are also directed towards manufacturing companies and economic players in high environmental impact sectors who wish to experiment with and introduce, in synergy with the VET system, Work-Based Learning-Training-Solving pathways based on specific, concrete environmental sustainability challenges.

2. Guidelines Purpose

The guidelines of **Work Package 2** (p. 5, Intellectual Outcomes) aim to model, for the purposes of transferability, the following learning process competencies for educators and trainers within the VET system:

- Familiarize with the formulation of concrete environmental sustainability problems in terms of innovative and inclusive teaching, understanding how to transfer and reframe these issues from the specific industrial setting of a high-impact sector/production context to the VET setting.

- Implement concrete practices for the exchange and sharing of VET-Business Partner training pathways based on real sustainability challenges presented by companies to VET providers as case studies to be solved, in alignment with both the VET curriculum learning objectives and the needs for green skills and innovative problem-solving methods in specific industrial sectors.

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- Design educational/training cases on the topic of environmental sustainability, knowing how to translate a case study presented as a challenge by a specific company into didactical accessible and inclusive terms for Learners, using Work-Based Learning methods and inclusive approaches such as Flipped Classroom.

3. Implementation Expected Results

These guidelines pertain to WP2, focusing on the modeling and transferability of case studies and the design of educational/training cases from specific business contexts to VET settings (p. 3, Project summary sheet).

Their application, as widely as possible within the technical and professional VET system through targeted experimental pathways, aims to achieve the following outcomes:

- Medium term: standardization of methodologies for the design and teaching of sector studies, business testimonial pathways, and educational/training cases on environmental sustainability, in synergy with business partners from specific industrial sectors and based on their needs for green skills.

- Long term: implementation and innovation of VET curricula in accordance with regional, national, and European directives, both in terms of deliverable content (introduction of environmental sustainability as a standalone subject or as a transversal competence) and in terms of skills packages and certifiable professional profiles related to environmental sustainability, addressing the specific needs of the relevant industrial sector.

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I – Details of the Erasmus+ Green Skills 4 VET Project

1. Context & Starting Idea

1.1 Contextual Elements

The Erasmus+ GS4VET project is developed within the framework of the EU Agenda 2021-2027 priorities concerning climate change, environmental impact, and sustainable development, considering the key role that the economic and industrial system plays in its concrete capacity for resilience and response to the multiple challenges it faces.

In relation to the three selected priorities (p. 4), the project aims to achieve the following objectives:

1) Environment and Climate Change Mitigation:

With the ultimate goal of integrating environmental sustainability into the VET curriculum, in line with the European Council Recommendation on Learning for the Green Transition and Sustainable Development (2022), the project proposes the design, experimentation, validation, and release as Open Educational Resources (OER) of learning programs on sustainable development, built from real business scenarios, with the active involvement of companies from sectors with significant environmental impact.
The project is therefore focused on the theme of environmental sustainability, proposing targeted experiments aimed at innovating VET curricula based on real environmental issues that the economic and industrial system is currently facing and required to address. Environmental education plays a key role within VET systems, with the most immediate career pathway being the labor market and, primarily, the manufacturing industry.

2) Inclusion and Diversity:

In line with the EC 2021 document 'Guidelines for Implementation - Erasmus+ Inclusion and Diversity Strategy,' the project aims to develop and implement, at the VET level, learner-centered inclusive teaching methods designed to engage, motivate, and support the inclusion of students with low achievement, cultural or linguistic barriers, disabilities, and those at risk of dropping out of their educational or training programs due to these reasons. The project promotes the experimentation, with the aim of future implementation, of learning programs on environmental sustainability through the use of work-based and problem-based

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activities delivered according to the Flipped Classroom methodological approach, involving active student participation in the collective resolution of real cases.

3) Adapting the VET System to Labor Market Needs:

The project promotes the development and updating of VET curricula to better align with current Labor Market needs, particularly addressing the demand for Green Skills expressed by the manufacturing sector, which is tasked with managing the green transition. The industry involved in the project's partnership is a place where structured teams are already working to address sustainability issues, design and test solutions, and validate results. The expectation is to recruit new VET graduates each year who are aware of environmental issues and capable of providing tangible and qualified support.

In light of this, GS4VET identifies as Business Partners in the four European countries involved in the project (Portugal, Italy, Slovenia, and Croatia) companies from industrial sectors with significant environmental impact. These companies are addressing environmental issues in a technical and specific manner and express a need for skills and professional profiles related to this priority:

- Agro-food (Portugal)
- Mechanical engineering, specifically the production of refrigeration systems for food preservation (Italy)
- Textiles-Fashion, specifically the production of buttons (Slovenia)
  Logistics (Croatia).

The VET system is thus the ideal place to implement structured and replicable educational projects and programs focused on the environment, sustainability, and global citizenship. These initiatives aim, in the medium and long term, to introduce specific skills and profiles that are recognized and valuable in both the national and European Labor Markets.

The regulatory context of the 2030 Agenda sets a common goal (target 4.7) to '*ensure that by 2030 all learners acquire the knowledge and skills needed to promote sustainable development, including through education aimed at sustainable development and lifestyles, and global citizenship*.'

Furthermore, 2023 was the European Year of Skills, a community initiative aimed at promoting the development of professional skills to ensure that individuals, particularly future workers, have access to quality job opportunities and can support companies in enhancing the competitiveness of the European economic system.

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Finally, the new EU Skills Agenda for Employment recommends the development, particularly among young people, of knowledge and skills to tackle the dual green and digital transitions, equipping them to become informed, active, and prepared drivers of change.

- The Erasmus+ GS4VET project involves VET Providers in four European countries, including training centers and secondary schools with technical and vocational programs closely aligned with the production activities of their Business Partners:

- Escola Profissional Agrícola Quinta da Lageosa (Portugal)
- Istituto Istruzione Superiore "C. E. Gadda" (Italy)
- Strokovni izobrazevalni center Ljubljana (Slovenia)
- Skola za cestovni promet (Croatia).

To ensure the project aligns with the EU priority for the axis titled “Inclusion and diversity in all fields of education, training, youth, and sport,” GS4VET engages Learning Teams consisting of at least 20% individuals who exhibit low academic performance, high rates of absenteeism, linguistic or socio-cultural disadvantages, or who have disabilities and special educational needs.

The learning challenge posed by this project to its participants in the VET system also involves a key role for the four Teachers Teams. These teams are actively engaged from the initial stage of familiarization with real and concrete environmental sustainability issues – and from the outset in partnership with the sector-specific Business Partners (**WP2**) – through to the design, development, testing, and validation phases of innovative and inclusive educational programs at two levels of complexity: first, sector-specific (**WP3**), and subsequently, inter- and cross-sectoral (**WP4**).

To address the current and effective formulation of the questions that the green transition poses to VET systems and production sectors, and to design and test educational programs and potential solutions, the challenge also involves innovating teaching methods and learning programs.

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1.2 Starting Idea

The GS4VET project originates from a fundamental insight: addressing priorities such as environmental sustainability requires a systemic and synergistic approach. This approach must integrate practices of inclusion and diversity while also emphasizing the importance of aligning VET practices and programs with the actual and specific needs of the Labor Market.

The starting idea can be summarized in the following question: Through which best patterns of VET/BUSINESS relationships and innovative practices can the priority of environmental sustainability be addressed?

The key concepts underlying the project can be summarized as follows:

- **Focused pairing** VET Provider/Business Partner in a compatible sector, both actively involved from the beginning to the end of the project, for the design, experimentation, and validation of new educational programs focused on environmental sustainability. This process begins with concrete problems that companies are addressing and translates them from the business world to the educational sector.
- **Challenge-Oriented Approach**: This involves addressing a real case to solve – the challenge of environmental sustainability – by seeking practical ideas and solutions proposed by the Business Partner (BP) to the VET Provider (VETP). It also represents an innovative method for tackling issues in terms of knowledge, teaching, and testing. Learners are supported throughout both the learning and experimental phases, with teachers and the BP serving as continuous interfaces with one another, and both acting as evaluators during the testing phase.
- **The Additional Challenge of a Higher Level Leap**: To create new cross-sectoral pairings between VET Providers (VETP) and Business Partners (BP), transitioning from a sector-specific level to an inter- and cross-sectoral level. This approach enables entities from different industries and countries to develop one or more additional case studies on a new or common issue and to test ideas for its potential solution.

All of this further underscores the strategic importance of modeling individual activities from the very first operational Work Package (**WP2**, which is the subject of these guidelines), in which the partners are actively involved.

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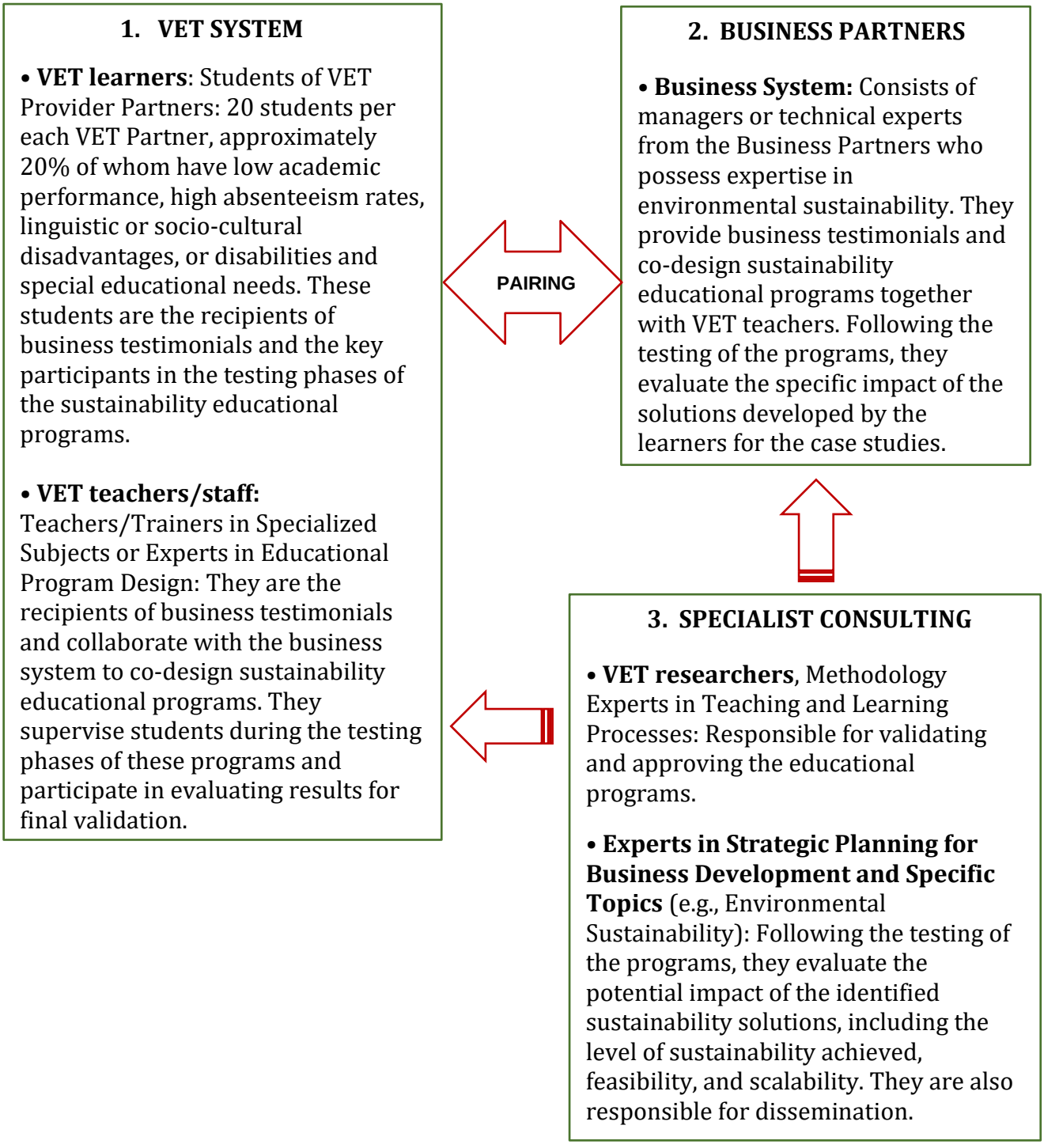
2. Target groups

The Erasmus+ GS4VET project identifies the following target groups within the VET and Business systems, providing for pairings between them with the support of a specialized consultancy system:



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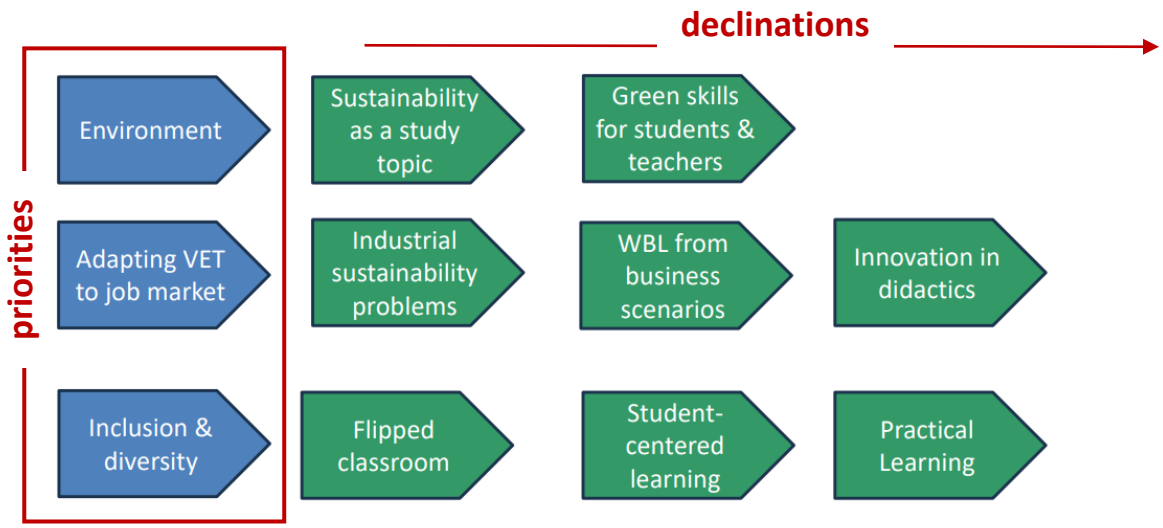
3. GS4VET Project General and Specific Objectives (Summary Charts)



GENERAL OBJECTIVES

Environment

Adapting VET to job market

a) Transfer real-world environmental sustainability challenges from the industrial setting to the VET setting, in order to integrate the School-Industry chain and align supply and demand dynamics.

b) Develop and/or enhance environmental sustainability competencies among VET Educators and Learners.

c) To innovate VET curricula by aligning them more closely with the needs of the Labor Market in their respective sectors.

d) Introduce environmental sustainability as a standalone subject in the VET curriculum or as an interdisciplinary topic, through new work-based and problem-based learning programs developed from real business scenarios.

Inclusion & diversity

e) Develop inclusive, learner-centered teaching methods at the VET level that engage and motivate students with disabilities, low academic performance, cultural or linguistic barriers, and those at risk of dropping out of their educational or training pathways.

The general objectives are detailed into specific objectives, which represent the purposes of the activities conducted within the project. (**Work Packages**).

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The Work Packages involving VET/B partners in operational synergy are **WP2**, **WP3**, and **WP4**. They aim to achieve the following results in terms of knowledge and skills, both at the sector-specific and inter- and cross-sectoral levels:

a) Acquire knowledge on specific environmental issues within individual production sectors and establish a concrete dialogue on these issues;
b) Co-design case studies and transform them into educational programs to formulate potential solutions for environmental sustainability challenges, supporting and motivating learner teams with inclusive and innovative work-based teaching methodologies;
c) Jointly test and evaluate the relevance and effectiveness of the solutions proposed by the learner teams.

These general objectives are broken down into specific goals, which define the purposes of the activities carried out within the project (Work Packages) and lead to tangible results:

SPECIFIC OBJECTIVES

WP2

a) Familiarize VET educators and learners with real and concrete environmental sustainability issues related to the manufacturing sector, fostering dialogue and exchange between VET institutions and Companies.

OUTCOMES

• **Case studies on environmental sustainability issues** in the production sector and **the design of educational cases.**

WP3

b) Develop innovative and inclusive educational programs on environmental sustainability specifically related to individual production sectors (with high environmental impact), to include sustainability as a competence in the VET curriculum at a **single-sector level**.

• **EDUCATIONAL PROGRAMS:** These programs involve the use of work-based and problem-based activities and are delivered using the Flipped Classroom instructional approach. This approach aims to support the inclusion of weaker students by reversing the traditional theoretical-frontal teaching method.

OUTCOMES

• Educational programs designed, tested, validated, and released as **OER** (Open Educational Resources) for the inclusion of environmental sustainability in the VET curriculum at a **single-sector level**.

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WP4

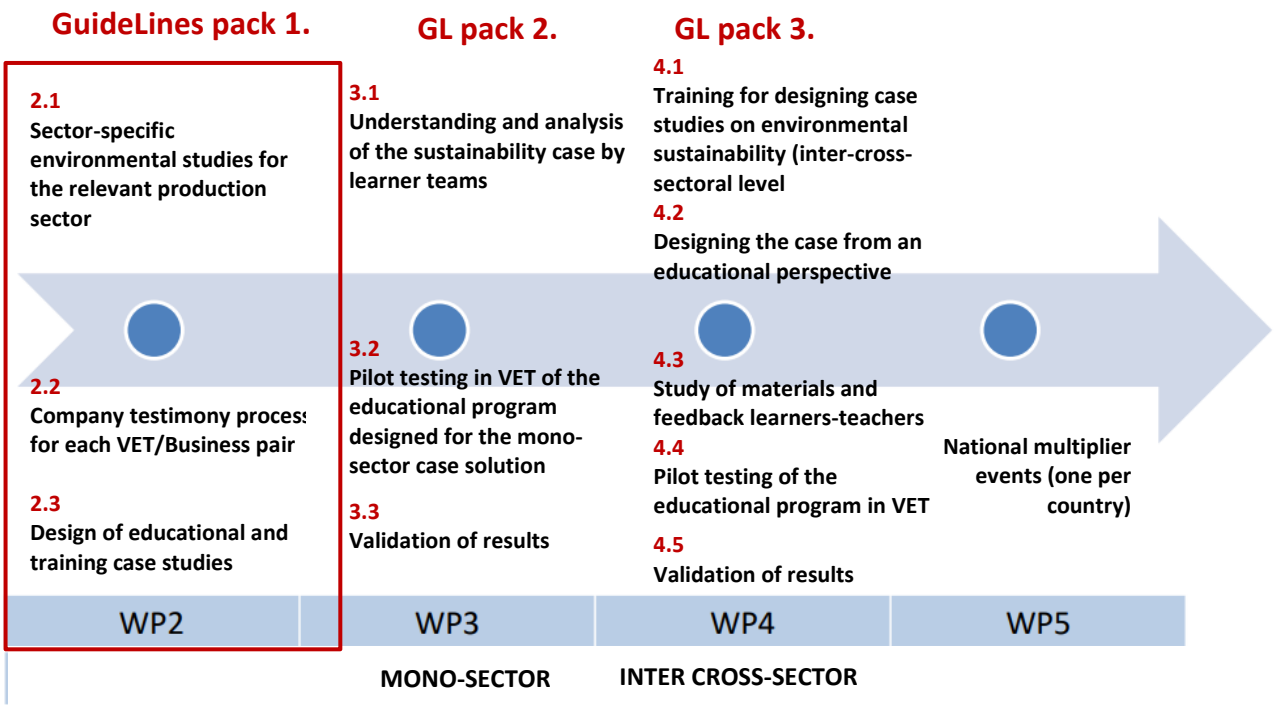
c) Develop innovative and inclusive educational programs on environmental sustainability applicable across various diverse production sectors, to include sustainability as a competence in the VET curriculum at an **inter- and cross-sectoral level**.

• **EDUCATIONAL PROGRAMS** as in **WP3**.

OUTCOMES

• Educational programs designed, tested, validated, and released as Open Educational Resources for the inclusion of environmental sustainability in the VET curriculum at an **inter- and cross-sectoral level.**

4. GS4VET Project Phases and Activities (Graphic Overview)



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5. GS4VET Project Partnership Composition

In the 4 European countries involved in the project – Portugal for the agricultural sector, Italy for mechanical engineering applied to the food supply chain, Slovenia for textiles and fashion, and Croatia for transport and logistics – 4 companies and an equal number of technical and vocational secondary schools with programs closely related to the production activities of the business partners form the partnership.

In **WP 2** and **3**, the Business-VET Provider pairing operates at the intra-territorial and intra-sectoral level (level 1 of project implementation complexity, mono-sectoral or within a single specific sector).

In **WP4**, new pairings will be tested at a higher level of complexity, namely inter-territorial and inter/cross-sectoral, involving VET Providers, companies, and different countries. For example:

• The Agricultural Vocational School from Portugal will be able to collaborate in this phase with the mechanical company from the Italian food supply chain;

• The Italian higher education institution specializing in mechanical engineering/mechatronics will be paired with the Slovenian company in the textile/fashion sector (button manufacturing);

• The Slovenian training center specializing in textiles and fashion will continue the project with the Croatian company specializing in transport and logistics;

• The Croatian school specializing in transport, circulation, and logistics will be paired with the agricultural consortium company based in Portugal.

Below is a detailed description of the types of entities involved in the project:

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Escola Profissional Agrícola Quinta

da Lageosa, Covilhã, Portugal
(Agricultural Vocational School)

https://www.quintadalageosa.pt/

Description: EPAQL is an agro-food institution affiliated with a 330-hectare agricultural estate, encompassing forests, pastures, orchards, and vegetable cultivation. Located in a prime area in the heart of Cova da Beira, in the northeastern mountains of Portugal, it lies midway between Porto and the Spanish border.
In 2022, EPAQL participated in the First Agricultural Innovation Fair in Fundão, Portugal, showcasing agricultural and food products. This fair focused on smart agriculture and the resilience of the environment, territory, and agricultural production sites.
In the same year, EPAQL also participated in International Amphibian Conservation Day by organizing, with its students, a reintroduction and habitat restoration activity for several threatened native amphibian species in the natural environment surrounding the school.

In cooperation with agricultural businesses in the Cova da Beira/Castelo Branco region, EPAQL also integrates its curricular teaching activities with seminars and case studies on circular economy, sustainable agricultural and livestock production techniques, digital technologies for crop and animal monitoring, as well as sustainable management of water and soil resources.

Study Tracks: The school trains professionals such as the Agricultural Production Technician, specializing in animal production, plant production, and agricultural product processing; the Forest and Environmental Resources Technician; the Gardening and Green Spaces Technician; and the Equine Management Technician. Additionally, the school offers a course for Agricultural Machinery Operators.

Mission: The Institute's mission includes, among other objectives, promoting culture in rural areas to counteract its devaluation relative to urban environments; developing and participating in projects with agricultural associations or companies that aim to experiment with new methods of sustainable agriculture, smart and

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precision agriculture technologies, and the preservation of genetic heritage in agricultural production (such as ancient cereals, tree crops, and fruit and vegetable varieties).

EPAQL, an institute fully dedicated to agriculture and agricultural mechanization, integrates environmental sustainability into its mission. This includes education on protecting and enhancing natural resources, preserving biodiversity of animal and plant species, and producing organic and low-impact agricultural and agri-food products.

Learners&Teachers: The student population is relatively small, comprising approximately 90-100 students, supported by around 20 teachers and technical instructors.

These students are distributed across the 4 to 5-year programs within various vocational tracks. Most of the students at the school come from the rural areas surrounding the municipalities of Covilhã and Belmonte. These areas are primarily inhabited by agricultural entrepreneurs, artisans, and traders in the clothing/wool/leather sector, in contrast to the depopulation trend affecting the northeastern region of Portugal.

The percentage of migrant students is around 10%, including internal migration from the islands to the mainland (Azores, Madeira) and, more significantly, students of African origin from former colonies (São Tomé and Príncipe, Cape Verde, Angola), along with a large Rhom minority.

The most common issues within this segment of the student population primarily involve basic literacy (Portuguese) and numeracy skills, as well as cultural integration into the social fabric of the host country.

Socio-Economic Context: The school, with its strong agricultural vocation, fosters deep cooperation with local producers, farmers, and livestock breeders, both professionally and personally.

This creates a strong sense of connection to the area, generating social cohesion in the region and promoting solidarity and teamwork among students. From the early years of their enrollment, students are assigned responsibilities related to the care and cleaning of barns and animals, maintenance of the school's technological equipment (machinery and tools for agricultural work), fruit and vegetable harvesting, as well as storage and packaging of products for sale.

This strong sense of community, coupled with the school's small size, fosters a successful environment in countering issues of demotivation and school dropout,

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which remains around 1% at most. Despite this, the school annually combats the trend of abandoning agricultural work and rural societies – a phenomenon affecting not only Portugal but all of Europe – by conducting awareness and guidance activities in lower secondary schools.

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AAPIM - Associação de Agricultores para Produção Integrada de Frutos de Montanha, Guarda, Portugal
(Association of Farmers for Integrated Mountain Fruit Production)

https://aapim.com/

Description: AAPIM is a non-profit producers' association established in 1994, based in the mountainous Guarda region in northeastern Portugal. Its mission is to develop support and consultancy models to promote competitive yet sustainable agriculture. This is achieved through technological innovation among its member producers and the introduction of low-environmental-impact production methods via integrated production (PRODI) and organic production (MPB).
Today, AAPIM is a nationally recognized reference association, awarded the Public Utility status by the Portuguese Government for the quality of its services.

Objectives/Mission/Strategy: AAPIM's objectives include:
- Promoting the training of members by acquiring technical and managerial skills essential for the competitiveness of their agricultural businesses;
- Encouraging the certification and promotion of products derived from integrated and organic production;
- Raising awareness among young students about agriculture, environmental respect, and sustainable development;
- Supporting rural development and enhancing employability in the region.

HR: AAPIM's permanent, paid staff consists of seven technicians with higher education in agronomic fields – such as organic agriculture, integrated production, plant protection product application, and sustainable agriculture – who provide assistance and consultancy to members and farmers in general. Additionally, the team includes three technicians with higher education in human resources, management, and economics.

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AAPIM has approximately 400 member farmers from the central and northern regions of Portugal, engaged in various crops and sustainable production methods. These farmers have technical training in integrated production, organic agriculture, and plant protection product application.

Moreover, the sustainable use of plant protection products, mandated by environmental protection and food safety regulations, requires producers to periodically inspect their equipment for applying these products. To support producers, AAPIM operates a Mobile Sprayer Inspection Center, recognized by the Ministry of Agriculture, and employs accredited inspectors to carry out these inspections.

Additional Informations: The rapid evolution of agriculture, from traditional production methods to digitalization, requires producers to acquire qualifications in various areas of knowledge and skills related to their activities and sustainable production methods. The training of members, promoted through various courses, training actions, promotion, and awareness activities developed by AAPIM, has had a positive impact on the technical and environmental advancement of producers and the subsequent increase in the sustainable competitiveness of their agricultural enterprises. AAPIM also engages in activities to promote and enhance agricultural heritage for school audiences in the Guarda/Cova Beira/Castelo Branco region and at the university level across northern Portugal. These efforts have led to measurable positive outcomes, including increased interest in traditional agriculture among local youth and the continued provision of agricultural education, as exemplified by the VET partner EPAQL in Covilhã.

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Istituto Istruzione Superiore "C. E. Gadda" (Langhirano e Fornovo Taro, Parma, Italia)
(Upper Secondary Education Institute)

CARLOEMILIOGADDA
Istituto d'Istruzione Secondaria Superiore

https://www.iissgadda.it/

Description & Socio-Economic Context: The "Carlo Emilio Gadda" Higher Education Institute, one of the four industrial sectors involved in the GS4VET project, represents the mechanical engineering sector, which is one of the production areas with the highest environmental impact. The project primarily involves the vocational program. Its two locations are situated in the province of Parma, known as the "Food Valley" for its production of cured meats, Parmigiano Reggiano, and other internationally certified food products. This area boasts a diverse industrial network, primarily focused on the agri-food sector but also on process engineering (refrigeration units, HVAC systems, aging, and preservation of food products), mechanics, mechatronics, automotive, and service industries.

The institute operates in close synergy with business partners, collaborating with numerous companies in the Parma foothill region, which are focused on automotive, metalworking, and mechatronic-food industries. It also hosts the Innovation Farm laboratories. "Innovation Farm" is adjacent to the school premises and has been active since 2017. It features laboratories for cutting and laminating carbon and composite materials for additive manufacturing, industrial robotics equipment, and remotely operated CNC machines for metalworking production.

It is a Territorial laboratory for employability (LTO) specializing in automotive and motorsport, aerospace and aeronautics, and industrial automation. Its purpose is to enhance structured collaboration between schools, training institutions, and businesses, with the goal of creating a highly specialized professional and technological education and training system. The Gadda Institute, Langhirano campus, will also host the upcoming "Prosciutto Academy" laboratories. This initiative represents a program agreement between public and private institutions to establish a salting and aging line for prosciutto, which will be used for educational purposes by schools participating in the agreement and local training organizations.

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The “Prosciutto Academy” will facilitate work-based and experiential learning, including through PCTO (Pathways for Transversal Skills and Orientation) programs, related to the production of Prosciutto di Parma and the maintenance of machinery and production facilities (refrigeration units, salting lines, and prosciutto preservation systems) specific to the agri-food sector.

Study tracks: With campuses in Fornovo Taro and Langhirano, it features the following programs: technical-economic (Administration, Finance, and Marketing), technical-informatic (Computer Science and Telecommunications), vocational (Maintenance and Technical Assistance in the mechanical and electronic sectors), and Applied Sciences High School (4-5 years).
The institute is equipped with the following facilities: a Chemical Instrumentation Laboratory (featuring a spectrophotometer, colorimeter, and microbiology instruments), a Science Laboratory, a Physics Laboratory, Computer Science Laboratories, 3D Printing Laboratories, a CNC Machine Laboratory, a Maintenance and Technical Assistance Laboratory (equipped with mechanical tools such as a lathe, milling machine, and welding equipment), and an Electronics Laboratory.

Projects Implemented in Environmental Sustainability and WBL:
1. Chemical and physical analysis of water from various sections of the Taro River, different sources along the Via Francigena, at the industrial discharge points of Parmalat SpA and companies in Ozzano Taro, and in the lakes of the Boschi di Carrega.
2. Project “Guardians of the Coast.” Sampling of microplastics along a section of the Ligurian coast. An initiative by the Costa Crociere Foundation.
3. WELAB WEMAT Project, initiated by the Department of Chemical, Life, and Environmental Sustainability Sciences at the University of Parma: mapping of nitrates in the river waters of the province.
4. STEAM Project “The Self-Wrapping Product,” initiated by CISITA Parma, the Departments of Chemistry and Engineering at the University of Parma (Tecnopolo), in collaboration with CIPACK and SITEIA.PR (eco-friendly packaging).
5. Project “Learning to Become” (Educational Frontiers) with activities in research and environmental education. Subjects include STEM, Italian, English, and civic education.
6. PCTO Project “What’s the Air Like,” requested by Terre Ducali of Langhirano: optimizing energy consumption in prosciutto production facilities using PLC systems.
7. PCTO Project “The Right Weight of Things 4.0,” requested by Terre Ducali of Langhirano: designing prototypes of food processing machines to reduce production waste.
8. Project “The Smart Home” in collaboration with Gewiss – Langhirano campus.

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9. Implementation of the “Smart Home” project through photovoltaic panels – Langhirano campus.
10. Project “Cargo Bike” in collaboration with the University of Modena for the development of highly recyclable battery packs and the design of cargo bikes for business contexts. Both designs are also intended to create micro-enterprises for individuals facing physical or social challenges.

Learners&Teachers: Approximately 1,110 students (70% Italian, 30% of migrant origin, and about 70 students with certified disabilities) are supported by around 200 teachers. The school's catchment area has a significant percentage of foreign students due to intense migration patterns affecting the high-density industrial areas of the Valli Taro and Ceno district (mechanical and automotive companies) and the Val Parma region (agri-food companies, including meat, cheese, and tomato production).

GAZZETTA DI PARMA

Provincia Noceto Medesano Fornovo

Fornovo Scelta dall'Upi per rappresentare gli studenti di Parma e provincia

Denisa Basha, dal Gadda fino al Sustainable Economy Forum

The students come from socially diverse backgrounds: those from educated or affluent families are interspersed with others in disadvantaged conditions, who often come from problematic social and familial environments. There are also disparities related to language skills or prior knowledge. Students from disadvantaged backgrounds often arrive from middle schools with disillusioned views of their own abilities or with a history of previous academic failures, and they respond with attitudes that make learning more challenging.
School dropout rates are not particularly high, although sometimes the prolonged stay of some students until the end of the curriculum results in mediocre learning outcomes. In response to this situation, the teaching staff strives to sustain the interest and participation of weaker students through various initiatives and educational strategies, including multidisciplinary approaches, remedial actions, and adjustments to learning styles and levels.

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Frigomeccanica SpA, Sala Baganza (Italia)

https://www.frigomeccanica.it/

Description: Frigomeccanica was founded in 1962 in Sala Baganza (PR), in the heart of the "Food Valley," with the goal, which it has fully achieved, of becoming a leader in refrigeration systems for food preservation. It is capable of designing turnkey solutions and systems such as:

- Complete aging lines for cured meats and cheeses;
- Thawing systems for the processing of fresh meat and fish;
- Air conditioning systems for clean rooms used in the processing and packaging of ready-to-eat products, such as dairy products, meat and fish, fruits, and vegetables;
- Systems for the preservation of fruits and vegetables.

The company originated from the pioneering idea of two brothers-in-law who initially decided to apply refrigeration technology to the traditional artisanal production of Parma cured meats and cheeses. In Italy, Frigomeccanica has built approximately 60% of the Prosciutto di Parma production facilities and about 90% of those for Prosciutto San Daniele.

Objectives/Mission/Strategy: By strategic choice, Frigomeccanica designs and engineers custom-built systems tailored to the specific needs of clients (cured meat producers, dairy companies, and fruit and vegetable processing companies). It maintains an inventory of semi-finished products for the storage of mechanical components purchased from its suppliers. However, assembly, testing, and both routine and extraordinary maintenance – whether on-site or remotely – are carried out by technicians directly at the end client's location. In terms of environmental sustainability, Frigomeccanica has long been dedicated to finding green solutions aimed at reducing the environmental impact of its products and processes. Every system designed and delivered by the company can be converted to solar energy,

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ensuring optimal environmental health and compliance with current regulations in the country.

HR: Frigomeccanica conducts feasibility studies and on-site training for technicians, focusing on:

- Physical-chemical properties and sustainability/performance impacts of refrigerants used in refrigeration systems;
- Collection and analysis of data related to the parameters of mechanical systems produced, useful for programming remote and/or real-time maintenance, particularly for monitoring and optimizing energy consumption, emissions, and production waste.

These are specific and highly professional skills demanded by the job market. The collaboration between Frigomeccanica and schools in this project aims to integrate sustainability into the VET curriculum by co-designing work-based learning pathways through business-education partnerships.

Additional Informations: In 2022-2023, Frigomeccanica, in collaboration with the "C.E. Gadda" Institute (a partner in the GS4VET project), is involved in the "Prosciutto Academy" network agreement in Langhirano (Parma), at the heart of the Food Valley. This program agreement involves the Province of Parma, the Union of Municipalities of Appennino Parma Est, the Municipality of Langhirano, and the Prosciutto di Parma Consortium for the establishment of the Local Laboratories for Employability "Prosciutto District Academy." The project is funded by provincial resources and co-financed by local private entities (companies, business associations, banking foundations).

The project includes the construction of a building to house mechanical systems (refrigeration units, clean rooms for salting and food preservation) for the production, salting, and aging of prosciutto. A fully equipped laboratory will be made available to the school and the local community for work-based, simulation-based, and professional training. Within the framework of the "Prosciutto Academy," Frigomeccanica will contribute by providing equipment (refrigeration units) and technical-procedural expertise to support the acquisition of professional skills for VET learners. These laboratory spaces will also be available for the experimental activities outlined in this project.

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SIC - Strokovni izobrazevalni center Ljubljana (Lubiana, Slovenia) (Vocational Training Center)

https://www.siclj.si/

Description: The Technical Education Center of Ljubljana (SIC Ljubljana) is a vocational and technical school founded in 1962, preparing students to enter the labor market or continue their education. SIC comprises three organizational units: the Secondary Vocational and Technical School, the Intercompany Training and Education Center, and the Ježica Driving School, which handles all categories of driving licenses.
The Secondary Vocational and Technical School offers programs in logistics, textile and fashion, and mechanical engineering.

Study Tracks: a) Short-cycle Vocational Education (2 years): Technological Process Assistant, Textile Reworker/Repairer; **b)** Secondary Vocational Education (3 years): Automotive Mechatronics Technician, Bodywork Repair Technician, Industrial Mechanic, Metal Grinder, Sheet Metal Worker, Tailor; **c)** Vocational-Technical Education (3 + 2 years): Mechanical Engineering Technician, Automotive Services Technician, Mechatronics Technician, Logistics Technician, Fashion Clothing Designer; **d)** Secondary Technical Education (4 years): Logistics Technician, Fashion Clothing Designer.
Over the past 10 years, the school has been actively involved in the process of modernizing vocational and technical education in Slovenia, with a strong emphasis on mastering key skills and fostering closer cooperation between education and the labor market.
In the GS4VET project, representing the Textile-Fashion sector – currently regarded as one of the industries with the highest environmental impact – the focus is on the Textile program (textile reworker/repairer, tailor, fashion and clothing designer). This aligns with the Slovenian partner company in the same industrial sector.
The school is equipped with dedicated classrooms and laboratories featuring the following equipment: 40 various types of sewing machines, a textile printing machine, a button-attaching machine, 2 embroidery machines, a microscope for textile fibers, and fashion design software.
Mission: As a pilot school for the introduction of new programs in the Slovenian educational system, SIC Ljubljana has gained extensive experience with innovative teaching and pedagogical approaches in secondary vocational education programs.

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The school has been actively involved in the reform of VET programs, focusing on competency-based learning. It also has many years of experience in international, national, and bilateral project cooperation, as evidenced by national and European awards.

The school has a dedicated department for international projects and has been coordinating or participating as a partner in numerous international projects for a decade. In 2015 and again in 2021, the school earned the Erasmus+ VET Mobility Charter, reflecting a high level of quality and strategic approaches in mobility projects. SIC Ljubljana is one of the Slovenian educational institutions offering short-cycle vocational education to students who, due to cognitive, mental, or social barriers, have been unable to complete compulsory education.

The 2-year program is designed to provide students with foundational skills to participate in the textile sector's workforce while gradually building their general knowledge to complete compulsory education.

Upon finishing the program, students can, and many do, enroll in secondary education for three or four years. SIC employs a positive reinforcement model to help these students overcome their academic challenges.

Teachers and career counselors, who meet with students one-on-one regularly, believe that the best results are achieved when students start to believe in their potential for success and recognize the importance of their school activities.

The school believes that involving these students in an international project (typically reserved for students with satisfactory grades) would significantly boost their self-confidence and serve as additional motivation for their academic work.

Learners&Teachers: The total number of employees is 130, and there are approximately 1,100 students, including 800 adult learners each year. Many of the students come from low- or middle-income families.

Around 30% of all students can be identified as coming from economically vulnerable families, based on the number of applications for subsidized school meals and textbooks (support services provided by the school).

Approximately 10% of the students are of immigrant origin. People from other former Yugoslav republics have moved to Slovenia to live and work since the 1960s (Serbs, Bosnians, Kosovars, and Albanians).

In the past two years, approximately 85% of the students have successfully completed the school year. This figure has remained fairly constant over the last 10 years. The school has a guidance counselor for underperforming students and two

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dedicated teachers who provide academic support in all subjects. Some first-generation immigrant students face challenges with the Slovenian language, as it is not their native language. Each year, several dozen students are enrolled in the mandatory additional Slovenian language course.

Students in short-cycle vocational classes often have very limited prior knowledge of academic subjects. Some face learning difficulties or other challenges due to emotional or behavioral issues.

The school employs various strategies based on individual student needs, including: consultations, additional explanations and online learning materials, personalized adjustments, extra individual sessions and study support, use of various teaching tools, case studies, and addressing specific problems during lessons.

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Dolejši modni gumbi d.o.o. (Šempeter v Savinjski dolini, Slovenia)

https://dolejsi.si/

Description: Dolejši Fashion Buttons Ltd, founded in 1938 by Czech craftsman Štefan Dolejši, who brought his expertise in button production to Slovenia, is currently based in Podlog, in the Savinjska Valley (Slovenia). The company is now managed by Nataša Dolejši, Štefan Dolejši's granddaughter. The company produces buttons from plastic (97% of the manufacturing process) and natural materials. The entire process, from material preparation to the final product, takes place at the company's facility. These buttons can be washed at temperatures of 60°C or 95°C, ironed up to 200°C, and dry-cleaned.

Most of the natural buttons are made from Colombian walnut wood. This material (vegetable ivory) comes from plantations, and its cultivation helps in the conservation of rainforests. Over 20 years ago, Armani was the first to use vegetable ivory in his creations. The company also produces buttons from coconut, horn, and wood. In 2014, the product range was expanded with the introduction of laser cutting technologies for plastic and wood, enabling the manufacturing of accessories and costume jewelry, decorative magnets, medals, and local tourist souvenirs. The buttons produced by Dolejši Fashion Buttons Ltd. are used on garments from boutique and major textile companies both in Slovenia and abroad.

Dolejši buttons are the result of traditional craftsmanship, innovation, and creativity. In designing its buttons, Dolejši follows global fashion trends. The company partly still uses manual button machines for production, but today the majority of buttons are produced using semi-automatic and automatic machines. At the end of 2022, the machinery was upgraded with a state-of-the-art laser cutting machine.

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Objectives/Mission/Strategy:
Social responsibility guides Dolejši to incorporate environmental protection efforts into its strategic plan. Therefore, the company will implement a development model that defines and pursues goals and activities aligned with societal expectations and values. The company aims to reduce its carbon footprint by introducing new processes for producing polyester material, which is currently generated as waste. Since polyester is a type of plastic that is not easily recyclable through traditional methods (such as melting), Dolejši is developing a model for recovering scraps and waste of this material. The plan involves grinding the polyester waste and reintegrating it into the production cycle for manufacturing buttons and other decorative products. Dolejši aims to become the first Slovenian company to reduce waste internally by minimizing raw material consumption and reusing waste to produce material for new products. This will also allow the company to differentiate itself from other button manufacturers in the European region, which is key to gaining recognition, commercial success, and a competitive advantage. The objectives that Dolejši aims to pursue in its sustainable innovation project are: Develop a process for reusing waste generated in the current button production; Create original bio-based materials for the manufacture of new products; Define technological processes for the processing of the newly developed material; Design innovative, sustainable, modern, and aesthetically appealing decorative elements.

HR: The company employs, in addition to the owner, workers responsible for project development, implementation of the production process, quality control of products, packaging and shipping, and documentation processing.

Additional Informations: Previous Experience of Collaboration Between the Company and School in Training or Work-Based Learning Projects:
- October 2016: Organized and delivered an 8-hour training course on button manufacturing for textile discipline teachers at the Center for Vocational Education Ljubljana (Center for Vocational Education Ljubljana).
- 2019 and 2020: Partnership with the Human Resources Development Company “Novus” in the project "Development and Implementation of Long-Term Programs for Social Activation and Empowerment of Individuals for Easier Entry into the Labor Market."

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SCP - Škola za cestovni promet (Zagreb, Croazia)
(Road Transport School)

https://www.scp.hr/

Description: Škola za cestovni promet (SCP, Road Transport School) in Zagreb, founded in 1949 and currently the only traffic school in the Republic of Croatia, boasts over 70 years of tradition in education and training in the field of road transport and logistics. The school is open to collaboration at local, national, and international levels. By decision of the Agency for Mobility and EU Programs, it holds the Erasmus Charter for Vocational Education and Training Mobility 2020-1-HR01-KA120-VET-094647. In the context of the GS4VET project, representing the Logistics sector – currently regarded as one of the areas with the highest environmental impact – the VET program "Logistics and Shipping Technician" is involved. This aligns with the Croatian partner company of the project, which operates in the same economic sector.

Since the 2016-17 school year, SCP has been involved in the pilot project "Schools for Health in Europe" (SHE), with the aim of creating an inspiring environment to enhance teacher motivation and job satisfaction, and to provide a safe and positive learning environment for student growth and development. SCP is one of the eight Croatian secondary schools that are members of the SHE network.

The school implements a comprehensive school prevention program aimed at encouraging positive overall development (physical, mental, emotional, social, and professional) of students, promoting healthy lifestyles and socially acceptable behaviors, and preventing early signs of risky behavior. The goal is to assist students with learning and behavioral difficulties, thereby preventing academic failure and dropout. The program is led by a school psychologist and an educator. The school has over 10% of students with disabilities (specific learning difficulties, emotional challenges, attention deficit or hyperactivity) who study according to the regular curriculum with individualized teaching procedures and/or content adjustments.

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Study Tracks: SCP provides education for students and adult learners to acquire professional qualifications in the following areas: Road Traffic Technician (four-year program); Logistics and Shipping Technician (four-year program); Motor Vehicle Driver (three-year program).
Additionally, the school also conducts professional training for adult learners in the following areas: Driving Instructor for all categories, Vehicle Technical Inspection Supervisor, Traffic Internal Control Inspector, Motor Vehicle Driver for the transport of dangerous goods by road, Training for Machine and Equipment Operators.
The training profiles offered by SCP provide highly specialized skills closely related to the environmental impact issues associated with the sector's activities.
For the "Road Traffic Technician" course, for example:

- Study, Collection, and Monitoring of Traffic Data: Gathering and analyzing data related to traffic phenomena.
- Order Processing: Sorting and managing orders, selecting the appropriate types of vehicles for cargo transport.
- Route Planning: Determining and selecting routes for urban and interurban contexts.
- Weather and Conditions Assessment: Assessing meteorological and other conditions for transportation.
- Timetable Development: Participating in the creation of schedules for line transport.
- Traffic Safety Management: Managing traffic safety services in urban and interurban areas.
- Regulatory Monitoring: Monitoring regulations in the transport sector, particularly road and urban transport, and their connections with other transport sectors.
- Modern Transport Solutions: Organizing modern transportation methods, including combined transport, integrated transport, and electric mobility.

For the "Logistics and Shipping Technician" course:

- Last-Mile Logistics Management: Organizing and managing last-mile logistics in an urban context.
- Transportation Organization: Organizing transportation for shipments by road, rail, air, sea, and river.
- Goods Handling: Managing the handling of goods, including packaging, repackaging, unpacking, weighing, sorting, palletizing, and sampling.
- Packaging Selection: Selecting the most appropriate packaging for individual goods.
- Route Optimization: Identifying the most favorable transport route for directing goods.

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- Efficient Transportation: Ensuring a transportation process that is rapid, safe, sustainable, and cost-effective.
- Intermodal Transport Organization: Organizing intermodal transport solutions.
- Specialized Transport: Organizing the transport of live animals, perishable goods, and dangerous substances.

Learners&Teachers: The school has 780 enrolled students distributed across 32 classes, and approximately 400 adult learners attended during the 2021/22 academic year. SCP provides favorable conditions for the education of both regular students and adult learners through its material working conditions.

Classes are managed by experienced teachers (70 in total). The quality of their work is validated by their appointments as teacher-mentors or advisors, with 12 teachers having been promoted to these roles so far. The programs use modern technology and are continuously adapted to meet the needs of the workplace. Teaching takes place in well-equipped classrooms and during practical exercises, as well as in companies. For driver education and training, the school has a fleet of three cargo vehicles and five cars.

The Institute has a school library with over 10,000 titles and a broad range of professional literature. At the school, classes are organized not only as regular (theoretical and practical) but also as supplementary, additional, and optional.

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Tokić Ltd. (Zagreb, Croazia)

https://www.tokic.hr/en/

Description: With over 30 years of history, since the Tokić brothers, Ilija and Stojan Tokić, founded the company in 1990 and opened their first retail store, Tokić has become the leading auto parts retail chain in Croatia. The company partners with over 230 renowned manufacturers for all types of private and commercial vehicles. Tokić operates more than 140 retail stores in Croatia and Slovenia, offering a range of over 300,000 different products. Their inventory includes parts for motorcycles and scooters, trucks and buses, agricultural machinery, as well as tools and equipment for maintenance.

All of Tokić's suppliers meet the highest international standards for quality and safety (ISO 9000, ISO 14000, ISO/TS 16949, etc.), and most of them provide OE parts. In 2008, Tokić d.o.o. enhanced its competitiveness by becoming a member and shareholder of ATR International AG, a leader in international commercial cooperation among wholesalers of automotive spare parts.

In 2020, the company celebrated its 30th anniversary and marked the occasion by acquiring Bartog Ltd., the leading Slovenian tire retailer. With over 36,000 square meters of central warehouse space, the company is implementing a new system to enhance its management efficiency.

Objectives/Mission/Strategy: Tokić's vision is to create a technologically innovative company while remaining grounded in human relationships and tradition. The long-term goal for the company is to become a leader in the industry not only in its home country but also in Slovenia, Austria, Italy, and neighboring regions. As an industry leader, the company is fully committed to driver and vehicle safety, contributing to the overall safety of communities and society at large.

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HR: Tokić employs over 1,000 professionals with extensive experience and expertise in the automotive sector.

Additional Informations: The company has its own training center, "Tokić TEC," which offers specialized training programs for mechanics and auto electricians. Through these programs, participants can expand their skills and achieve an even higher level of work quality.

These training programs are strategically important for the company, both for maintaining professional compliance with international standards and for keeping up with the latest trends in the automotive sector. The goal of Tokić TEC is to provide superior quality training programs in the automotive field, enhance existing skills through professional development, and offer a space for acquiring new skills to deliver an even more professional approach to end customers. In addition to theoretical preparation, the training at the “Tokić TEC” center also focuses on practical work, simulating real-world conditions of an auto repair shop. The methodology includes the use of technical and educational equipment, as well as vehicles that simulate faults or malfunctions, which participants will learn to identify and resolve in a logical sequence.

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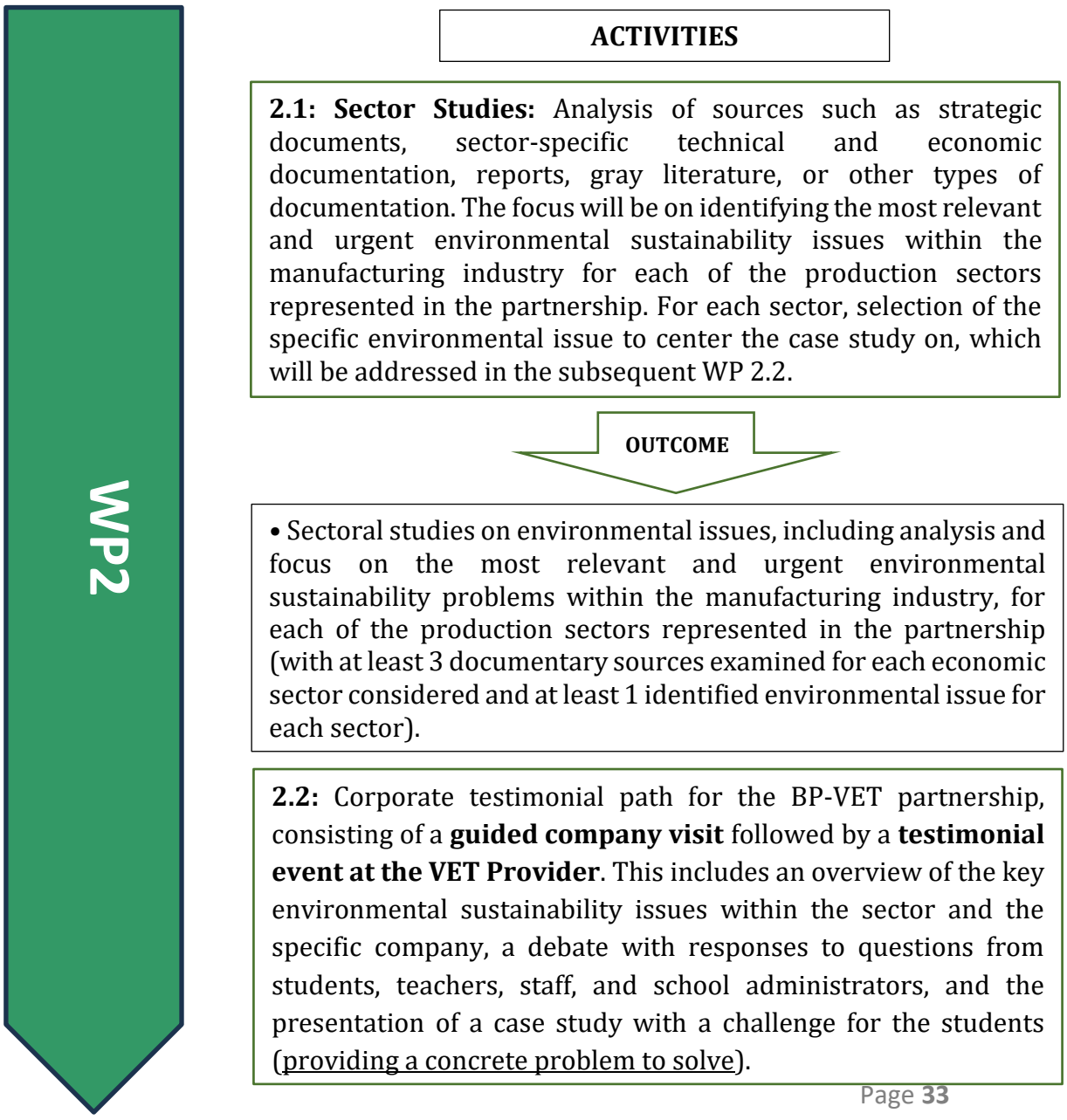
II – WP2 modeling process

6. WP2 Objectives and Activities

The activities planned in WP2 aim to analyze, focus on, select, and transfer key issues (e.g., environmental sustainability) from the Business sector to the VET sector. These issues directly affect the involved companies, which represent sectors highly impacted by the topic.

The results obtained at the end of WP2 and their quality are crucial for the successful implementation of the subsequent activities outlined in WP3.



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WP2

OUTCOME

• Corporate testimonial path for each Business-VET pair within the partnership, consisting of a guided company visit followed by a testimonial event at the VET Provider. This includes the presentation of a case study and the introduction of a challenge for the students (**providing a problem to solve**).

2.3: Design of the educational/training case on environmental sustainability, in alignment with the VET Provider's curricular learning objectives: adaptation of the case study presented as a challenge during the testimonial event to make it accessible to students; co-design by VET and Business Provider teachers and preparation of relevant educational/study materials (handouts, slides, audio-video content, etc.). Definition of criteria and development of a **feedback grid for students** to address their questions, concerns, and requests for clarifications following their initial individual study of the educational case.

OUTCOME

• **Design of the educational/training case** on environmental sustainability, aligned with the curricular learning objectives (1 case for each VET Provider): adaptation of the case study introduced as a challenge by the Business Provider during the corporate testimonial path, to make it accessible to students. This includes at least one set of materials for each VET Provider, comprising at least one multimedia/digital resource.

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7. Evaluation Indicators and questionnaires

The summary chart presents the evaluation indicators used in the Erasmus+ Green Skills 4 VET project to measure the effectiveness of the activities carried out in the Work Package addressed by these guidelines: **WP2.1 Sectoral Studies**, **WP2.2 Corporate Testimonial**, and **WP2.3 Educational Case Design**.
These indicators are categorized into quantitative and qualitative types to provide a comprehensive assessment.
Quantitative indicators measure numerical aspects, such as the number of documentary sources reviewed or the number of participants involved, while qualitative indicators evaluate aspects such as the reliability of information, the relevance of corporate testimonials, and the quality of the educational materials prepared.

	QUANTITATIVE	QUALITATIVE
WP2.1 Sectoral Studies	- No. of documentary sources reviewed for each economic sector (≥3) - No. of environmental issues identified for each sector (≥1).	- Reliability, authority, and quality of the reviewed documentary sources; - Relevance and appropriateness of the information contained in the documentary sources; - Significance of the environmental issues identified for each sector.
WP2.2 Corporate Testimonial	- No. of testimonial paths actually conducted compared to those planned - No. of Business Provider individuals involved for each sector (≥1 per Business Provider) - No. of participants at the event (20 students; 2 teachers; 1 VET Provider administrator. - No. of feedback/effectiveness questionnaires completed and returned (for each path, ≥14 returned by students, 2 by teachers, 1 by Business Provider).	- Relevance of the Business Testimonial's role in relation to the objective of the testimonial - Engagement and interest demonstrated by the participants - Accessibility of the problem from the students' perspective (Is the challenge within the students' capability?) - Student satisfaction with the challenge (>60% of the total) - Level of educational effectiveness as assessed by the teachers (>60%).

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WP2.3 Educational Case Design	- No. of educational/study materials prepared in the design of the case study (handouts, slides, audio-video content, etc.) (≥1 set of materials for each VET Provider). - No. of multimedia/digital materials prepared (≥1 per set).	- Quality, relevance, and suitability of the prepared materials. - Completeness of the student feedback grid following the initial engagement with the case study (≥60% form completion).

In this WP, both the students and the companies that participated in the company visits and business testimonies were given anonymous questionnaires. These questionnaires, which assessed the students' satisfaction and gathered their perspectives on the activities conducted, included binary, multiple-choice, and scale-based questions with the following items:

STUDENT SATISFACTION QUESTIONNAIRE:

Section 1: Demographic Information
(Data to identify the age, gender, country, and field of study of all students completing the questionnaire)

- Field of Study

- Country

- Age

- Gender Identity

Section 2: Motivation
(Questions – both binary and scale-based – on students' opinions or perceptions regarding the issue of environmental sustainability).

- At school or in your free time, have you ever participated in educational projects on natural environment protection and/or pollution? (Yes/No)

- If the answer to the previous question is YES, how much did you enjoy these activities? (scale from 1 = not at all to 5 = very much)

- How important are environmental sustainability issues to you in general? (scale from 1 = not at all to 5 = very much)

- After participating in the activity, has your concern/interest in environmental sustainability increased? (scale from 1 = not at all to 5 = very much)

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Section 3: Learning
(Questions about students' opinions regarding what they learned during company visits and lessons.)

- During the project activities, did you enjoy meeting the entrepreneurs and/or visiting the companies? (scale from 1 = not at all to 5 = very much)

- Do you think this method of organizing lessons is more motivating/interesting than traditional classroom teaching? (scale from 1 = not at all to 5 = very much)

- Do you think this method of organizing lessons helps you learn or understand things better compared to traditional classroom teaching? (scale from 1 = not at all to 5 = very much)

- During the project activity, did you acquire information about the impact of industrial/production activities on the environment? (scale from 1 = not at all to 5 = very much)

- During the course of the project, did you gather information on the efforts and actions that the manufacturing/industrial sector undertakes to reduce pollution and its impact on the natural environment? (Scale from 1 = not much to 5 = very much)

- Overall, I believe that the manufacturing/industrial sector is doing a good job in combating or preventing negative impacts on natural resources. (Scale from 1 = not much to 5 = very much)

Section 4. Future Career Prospects
(Impact of the project activities on students' perceptions of their future job prospects, career, or further study).

- Do you think that meeting entrepreneurs or visiting companies helps you make informed decisions about your future (such as university, career, etc.)? (Scale from 1 = not much to 5 = very much)

- Do you think that meeting entrepreneurs or visiting companies is helping you understand how the job market works? (Scale from 1 = not much to 5 = very much)

- After meeting with entrepreneurs/companies, are you interested in choosing a university course or pursuing a job in the manufacturing/industrial sector you visited? (Scale from 1 = not much to 5 = very much)

- After meeting with entrepreneurs/companies, would you be interested in pursuing a career as a Sustainability Manager or an Environmental Sustainability Technician/Engineer? (Scale from 1 = not much to 5 = very much)

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QUESTIONNAIRE FOR COMPANIES:

- How much strategic/interesting is it for your company to maintain relationship with the education sector? (scala da 1 = non tanto a 5 = moltissimo)

- Which are the main reasons for your company to participate in a school education project?

- Contributing to design the educational curriculum
- Introducing industry related topics in the didactic contents
- Innovating the teaching methodology (e.g. problem-based learning, work-based learning)
- Contributing to develop strategic skills in the future work force
- Stimulating intererest for your production/industrial sector within young people
- Other

- Is your company potentially interested in/looking for skilled professionals such as Sustainability Managers or Technicians? (scala da 1 = non tanto a 5 = moltissimo)

- Please rate the level of interest about your company's lessons/presentations you perceived among the students (scala da 1 = non tanto a 5 = moltissimo)

- How much are you satisfied from the cooperation/communication level from the school's Principal/teachers? (scala da 1 = non tanto a 5 = moltissimo)

- Which are the main drivers of motivation for you to cooperate with schools?

- Contributing to the growth of society
- Sharing your own knowledge/values with the educational sector
- Leaving a legacy to young people
- Offering young people qualified job opportunities
- Other

- And finally, how much did you enjoy meeting the students?

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8. Partnership: Characteristics, VET-Companies Matching, Roles in the Project

Among the transferability objectives of these guidelines is the focus on best practices for forming VET/Business partnerships. It is therefore crucial to understand the characteristics and roles – transferable to other scenarios and contexts – that individual partners should possess to create an effective operational match for project objectives, both at a single-sector level and at a more complex inter-sectoral and cross-sectoral level.

a) Characteristics of Partners for Transferability:

• **VET**: Presence of technical-professional expertise applicable by vocation to specific industrial sectors; Interest in implementing and defining a training offer and curricula that better align with the needs of the relevant labor market.
• **BP**: Membership in a high-impact sector/value chain relevant to the partnership's priority (e.g., environmental sustainability in GS4VET); Presence of interest/motivation to implement/innovate specific responses to relevant issues; Existence of problems and organizational practices related to the partnership's focus area.

b) Criteria for Focused Mono-sectoral and Inter/Cross-sectoral VET/Business Pairing for Transferability:

• **Level of Complexity 1 (Sector-specific Pairing**): To enable the start of a practical VET/BP dialogue focused on developing skills to solve a real environmental sustainability issue, the initial matching of participants takes place within local and specific sector contexts. The goal is to establish and share clear communication channels between the Business and VET contexts for transferring a case history from BP to VET as a concrete challenge to be solved. At this initial level, the business case is converted into a learning package for the learner teams, employing innovative methodologies and multi-format tools.

• **Complexity Level 2 (inter/cross-sectorial pairing):** After experiencing activities within local and sector-specific contexts, the learning process can be transferred to a higher level of complexity. VET and BP will experiment with a new pairing involving other participants to replicate the activities conducted at the mono-sectorial level. The goal is to develop innovative educational programs applicable to multiple production sectors, starting from the definition of thematic cases that are relevant across these sectors (for example, environmental sustainability: reducing pollutant emissions, waste management, energy efficiency).

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For the transition from level 1 to level 2, a structured **TRAINING** action with all partners is necessary, aimed at:
• comparing and exchanging the various approaches, methodologies, tools, and responses developed at level 1 of mono-sectorial work;
• defining the new VET/BP pairings based on criteria that bring together sectors that can be integrated (by supply chain, product/service logic, similar manufacturing characteristics, common issues);
• sharing areas of environmental sustainability common to the economic sectors and designing one or more common case studies at the inter and cross-sectorial level, on which to subsequently build individual training programs and focus the related experimentation in VET.

The transition from an intra-sectorial to an inter and cross-sectorial level requires the implementation of virtual/remote **cooperating practices tools**. These tools will enable participants to collaborate, support each other, implement, evaluate, and validate the tools, content, and outcomes related to the new issue.

c) Criteria for role placement in the project for transferability:

VET PARTNERS

WP2 (sector studies, business testimony pathways, case study design): supports in identifying skill gaps related to the theme (e.g., environmental sustainability); organizes business testimony pathways at BP; co-designs the sector-specific familiarization path with a concrete business problem (e.g., environmental sustainability); transforms the business case into a teaching case and designs the educational pathway for learners (methodological framework, learning objectives, materials).

BUSINESS PARTNERS

WP2 (sector studies, business testimony pathways, case study design): identifies a priority issue related to the theme (e.g., environmental sustainability) specific to its production sector and company context, presenting it as a challenge to the VET Provider; supports the VET Provider in identifying sector-specific themes, technologies, and processes to achieve the identified training objectives.

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9. Other Partners

The scope of the overall objectives and the management of the complexity transition required for this type of partnership project – namely, the shift from the mono-sectorial and sector-specific level (**WP 2** and **WP 3**), where Partners operate within the same sector and local context addressing an internal environmental sustainability challenge, to the inter and cross-sectorial level (**WP4**), where a re-matching of participants occurs with the selection of new environmental sustainability challenges or a common challenge – requires the involvement of at least two additional skilled subjects:

- An **applicant with expertise in innovative educational methodologies** and work-based learning, needs analysis and skill gap assessment for various target groups, and the design of training programs aimed at aligning competencies with the requirements of the labor market. This includes activities such as co-designing accessible educational tools, evaluating the green competencies actually developed in students and instructors, validating environmental sustainability training programs, and modeling these programs for replicability.

This aims to introduce and implement skills and curricula, and update the training offer by incorporating the theme (in this specific project, environmental sustainability) as a new subject and/or as an interdisciplinary theme in the study program.

- An **"objective" (super partes) Consultant** with expertise in the project's focus area – specifically Sustainability, Environment, and the mega-trend of Green Transition – who will be involved in identifying innovations, ideas, and trends, designing and implementing interventions, and evaluating impact. This consultant will manage and implement the dissemination plan for each activity throughout the project's lifecycle and assess the potential impact of the solutions developed by participants in the environmental sustainability challenge in terms of actual sustainability, feasibility, and scalability.

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10. WP2 Modeling for replicability

Specific Objective of WP2: To familiarize VET educators and learners with real and concrete environmental sustainability issues related to the manufacturing sector, facilitating dialogue and exchange between VET Providers and Business Partners.

10.1 WP2. Activity 1. Sector Studies

Objectives	Conducting a sector study on the topic of the experiment (e.g., environmental sustainability).
Activities	Analysis of sources such as programmatic documents, sector-specific technical and economic documentation, reports, grey literature, or other types of documentation, and identification of the most relevant and urgent environmental sustainability issues within the manufacturing industry for each of the sectors represented in the partnership. For each sector, select the environmental issue to focus on for the testimony to be provided in the subsequent **WP 2.2**.
Target Participants	• ≥1 manager/technical expert per Business Partner with expertise in environmental sustainability/HR management. • ≥1 VET educator specialized in the relevant subject area. • ≥1 expert in innovative educational methodologies and assessment methods. • 1 expert in communication/dissemination and validation. • ≥20 students per VET Provider, with approximately 20% having poor academic performance, high absenteeism, language barriers, socio-cultural disadvantages, or special educational needs
Expected Outcomes	Sector studies on environmental issues, including analysis and focus on the most relevant and urgent environmental sustainability problems within the manufacturing industry for each of the production sectors represented in the partnership. This includes examining at least 3 documentary sources for each economic sector

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	and identifying at least one significant environmental issue for each sector
Evaluation Indicators	**QUANTITATIVE** • No. of documentary sources examined for each economic sector (≥3) • No. of environmental issues identified for each sector (≥1) **QUALITATIVE** • Reliability, authority, and quality of the examined documentary sources • Relevance and adequacy of the information contained in the documentary sources • Significance of the environmental issues identified for each sector
10.2 <u>WP2. Activity 2</u>. Business Testimonial Pathways and Challenge Launch from BP to VET	
Objectives	• Implementation of a BP-VET business testimony pathway consisting of: - guided company visit to the BP. - Un evento di testimonianza presso VET Provider • 1 testimonial event at the VET Provider, featuring a presentation by the BP to VET students on a concrete case study related to the specific production context.
Activities	Business testimony pathway for the BP-VET pair, comprising a **guided company visit** and a **testimonial event at the VET Provider**: Presentation of the main environmental sustainability issues of the sector and the specific company context; Discussion session with answers to questions from students, educators, staff, and school administrators; **Presentation of a case study, including the launch of a challenge to the students (providing a concrete problem to solve).**
Target Participants	• ≥1 manager/technical expert per Business Partner with expertise in environmental sustainability/HR management. • ≥2 VET educators for the relevant subject area + ≥1 school principal.

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	• ≥1 expert in innovative educational methodologies and assessment methods. • 1 expert in communication/dissemination and validation. • ≥20 students per VET Provider, with approximately 20% having the same characteristics described in Activity 1.
Expected Outcomes	Business testimony pathway for each Business-VET pair in the partnership, consisting of a guided company visit and a testimonial event at the VET Provider, featuring the presentation of a case study and the launch of a challenge to the students (providing a problem to solve).
Evaluation Indicators	**QUANTITATIVE** • No. of testimony pathways actually conducted compared to those planned • Number of BP representatives involved for each sector (≥1 per BP) • Number of participants at the event (20 students; 2 educators; 1 VET principal) • Number of feedback/effectiveness questionnaires completed and returned (for each pathway, ≥14 returned by students, 2 by educators, 1 by BP) **QUALITATIVE** • Relevance of the business witness's role to the objective of the testimony • Engagement and interest demonstrated by the participants • Appropriateness of the problem for students (Is the challenge within the students' capabilities?) • Student satisfaction with the challenge (>60% of total students) • Effectiveness of the educational experiment as assessed by teachers (>60%)

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10.3 - WP2. Activity 3. Development of the Case Study on Environmental Sustainability at the Intra-Sectoral Level

Objectives	• Development at the VET Provider of a case study/training project accessible to students on the experimental topic (e.g., environmental sustainability), consistent with: - The VET Provider's curricular learning objectives for the relevant subject area - The formulation of the case study presented as a concrete challenge by the Business Partner in Activity 1
Activities	• Design of the educational/training case study on environmental sustainability, aligned with the VET Provider's curricular learning objectives: adaptation of the case study presented as a challenge during the testimony to make it accessible and relevant for students. • Co-design by VET educators and Business Partners and preparation of related educational/study materials (handouts, slides, audio-visual content, etc.). • Definition of criteria and development of a feedback grid for students, including their questions, concerns, requests for clarification, etc., following their initial individual study of the case study.
Target Participants	• ≥2 VET educators for the relevant subject area + ≥1 school principal • ≥1 expert in innovative educational methodologies and assessment methods • 1 expert in communication/dissemination and validation • ≥20 students per VET Provider, with approximately 20% having the same characteristics described in Activity 1
Expected Outcomes	Design of the educational/training case study on environmental sustainability, aligned with the curricular learning objectives (1 case study per VET Provider): adaptation of the case study presented as a challenge by the BP during the business testimony pathway, to make it accessible to students. Each VET Provider should receive at least one set of

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	materials that includes at least one multimedia/digital resource
Evaluation Indicators	**QUANTITATIVE** • Number of educational/study materials developed in the case study design (handouts, slides, audio-visual content, etc.) (≥1 kit of materials per VET Provider) • Number of multimedia/digital materials developed (≥1 per kit) **QUALITATIVE** • Quality, relevance, and appropriateness of the developed materials • Completeness of the student feedback collection form following the initial engagement with the case study (≥60% completion rate of the form)

11. Experience Capsules from the Erasmus+ GS4VET Project

Here are some examples from the "best of" the four activity pathways as carried out by VET-Business pairs in their respective countries and sectors within the Erasmus+ Green Skills 4 VET project, specifically:

- **Activity 1:** Case histories tested in the project with reference to **sector studies.**

  Activity 2: Case histories tested in the project with reference to **business testimony pathways and the sustainability challenges posed by companies to the students.**

- **Activity 3**: Case histories tested in the project with reference to the **design of sector-specific educational cases** (e.g., improved pedagogical adaptation of the challenge case with best-practice material kits).

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<u>Activity 1</u>: Case histories tested in the project with reference to sector studies.

CASE HISTORY 1.

Company: **AAPIM** - ASSOCIAÇÃO DE AGRICULTORES PARA PRODUÇÃO INTEGRADA DE FRUTOS DE MONTANHA (Portugal)

Study materials provided: 8 sources of in-depth information on phytosanitary areas, land use, efficient water use in irrigation, and best practices for agricultural biodiversity.

Combined VET Provider: Escola Profissional Agrícola Quinta da Lageosa, **EPAQL** (Portugal).

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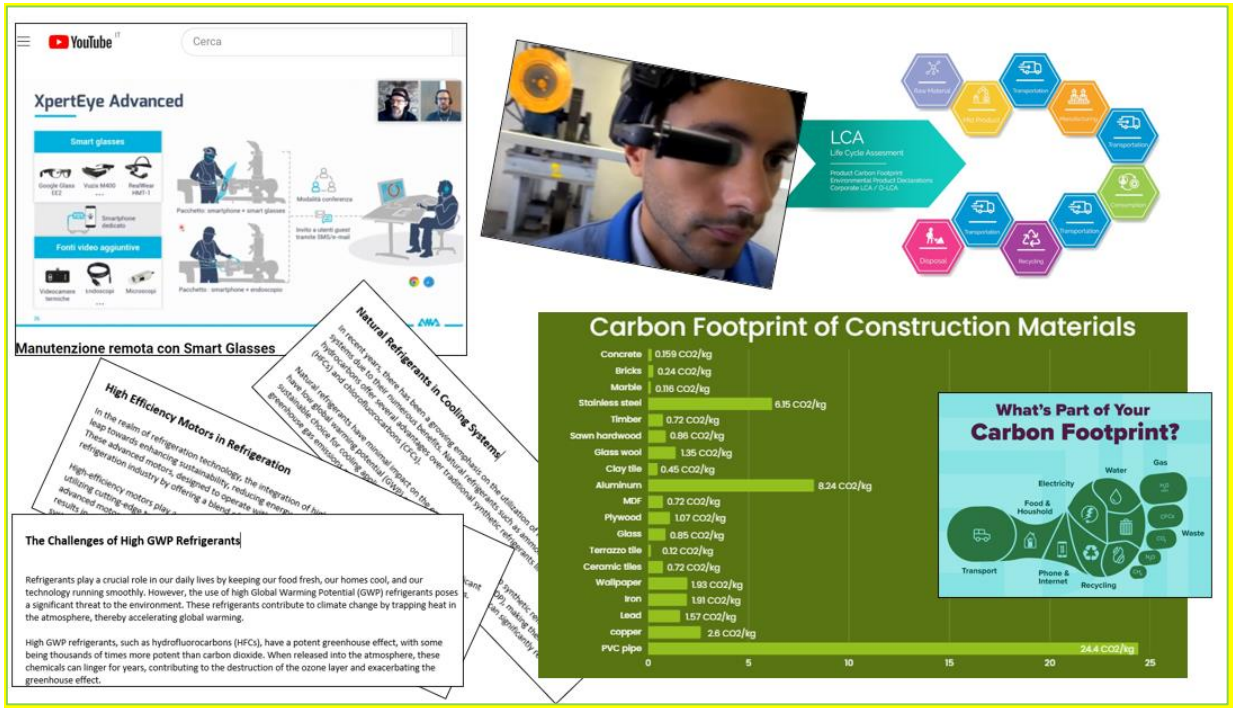
CASE HISTORY 2.

Company: **FRIGOMECCANICA SpA** - Leader in Refrigeration Engineering for Food (Italy)

Study materials provided: 23 multi-format sources (including 3 videos) on topics such as Carbon Footprint parameters and Life Cycle Assessment (LCA) methodology, sector-specific technological solutions for environmental sustainability (e.g., cogeneration, natural refrigerants and heat recovery in cooling systems, high-efficiency refrigeration motors), and the use and benefits of smart glasses for remote maintenance interventions.

Combined VET Provider: Istituto di Istruzione Superiore "**C.E. GADDA**" (Italy)



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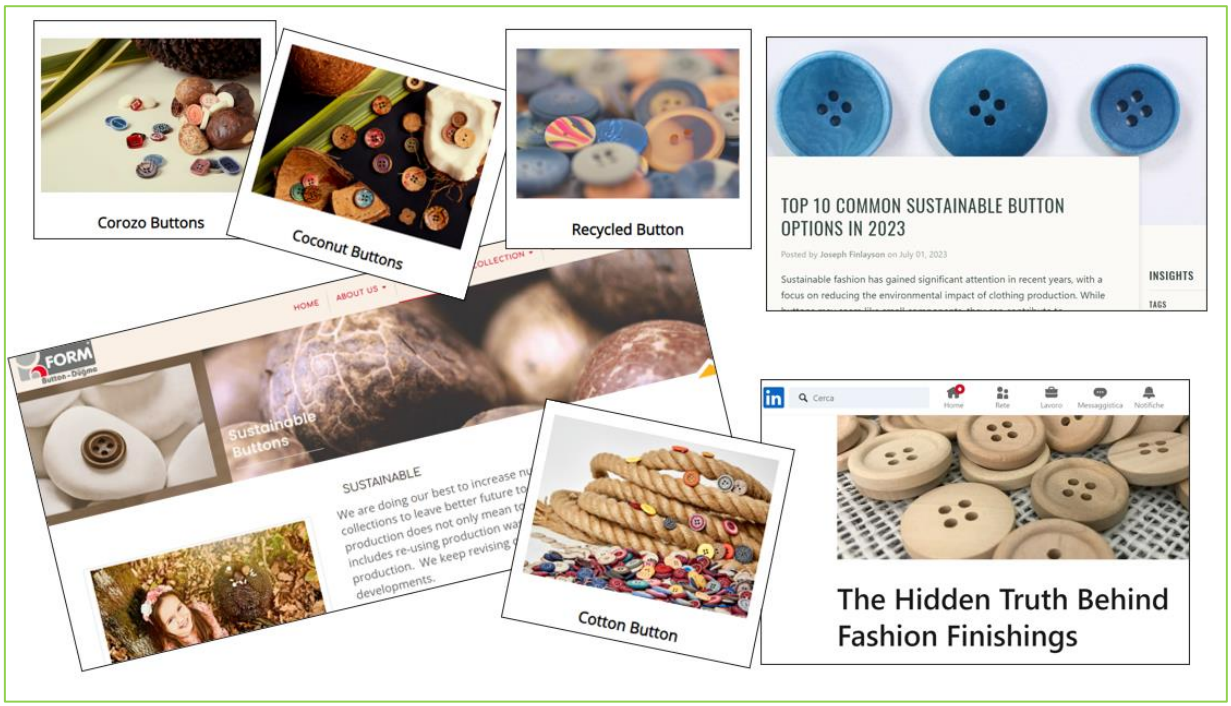
CASE HISTORY 3.

Company: **DOLEJSI MODNI GUMBI d.o.o**. – Since 1938, it has been producing buttons and fashion accessories in synthetic and natural materials, Šempeter in Savinjska dolina (Slovenia).

Study materials provided: 3 in-depth web sources on button manufacturing, including one on LinkedIn.

Combined VET Provider: Strokovni izobraževalni center di Lubiana, **SIC** (Slovenia)



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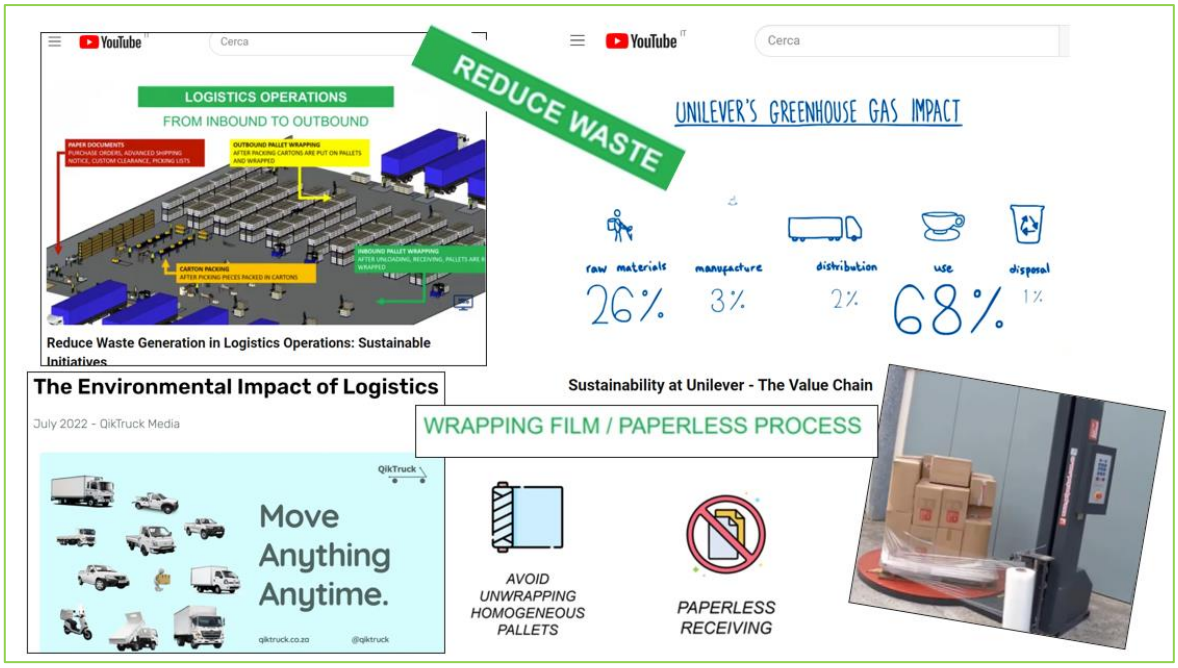
CASE HISTORY 4.

Company: **TOKIĆ**, Leading retail chain for automotive parts (Croatia).

Study materials provided: 3 multi-format in-depth sources on sustainability issues specifically related to the logistics sector, including 2 videos.

Combined VET Provider: Škola za cestovni promet, **SCP** (Croazia).



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<u>Activity 2</u>: Business testimony pathways and sustainability challenges posed by companies to students.

Below are some examples of how the specific activities were planned and executed: business testimony pathways (student visits to companies and company testimonies at schools) and the concrete challenges that were actually formulated and presented by companies to students in their respective countries and specific high environmental impact sectors: agriculture (Portugal), food production mechanics (Italy), textiles (Slovenia), and transport/logistics (Croatia).

The challenges formulated in this phase of the project will be subject to testing in the next phase (WP3).

CASE HISTORY 1.

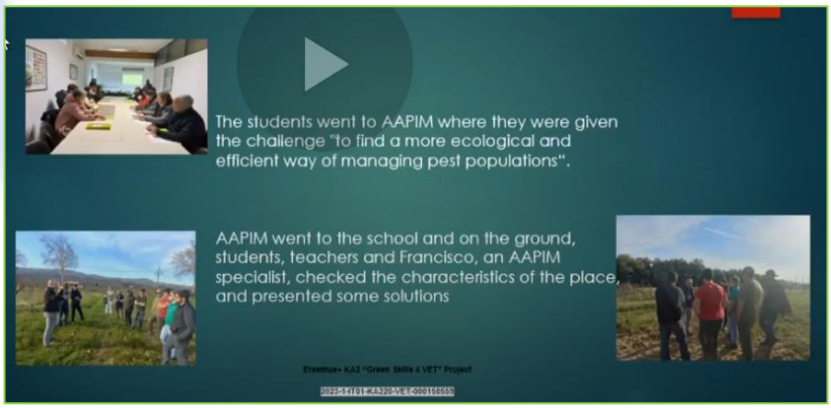
Company: AAPIM - ASSOCIAÇÃO DE AGRICULTORES PARA PRODUÇÃO INTEGRADA DE FRUTOS DE MONTANHA (Portugal)

Combined VET Provider: Escola Profissional Agrícola Quinta da Lageosa (**EPAQL**) (Portugal).

«Yesterday, in Guarda, our professional students visited AAPIM, where they learned about the company's mission and vision, as well as the service they provide to producers.

As part of these functions, **the company proposed the challenge of designing ecological infrastructures for vineyards and orchards.**»

Date	Type of activity (choose from drop down menu)	More information
17.01.2024	Company Visit	School go to AAPIM
13.12.2023 15.01.2024.	Lesson about sustainability	In school at class
29.01.2024	Practical activity / demonstration / laboratory	AAPIM come to school
17.01.2024	Launch of sustainability challenge to students	Made during the visit to AAPIM
6.03.2024	Practical activity / demonstration / laboratory	At school



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CASE HISTORY 2.

Company: FRIGOMECCANICA SpA - Leader in Refrigeration Engineering for Food (Italy)

Combined VET Provider: Istituto di Istruzione Superiore **"C.E. GADDA"** (Italy)

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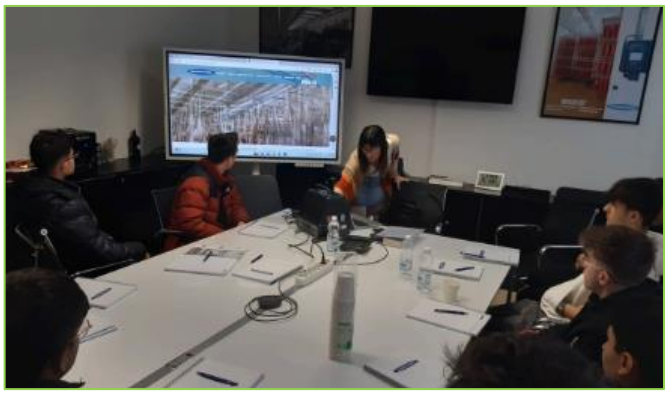
05.02.2024 – 16.02.2024 (Fornovo)		and launch 3 kinds of sustainability challenge by the company
26.02.2024 – 02.03.2024	Lesson about sustainability	By teachers
26.02.2024 – 16.03.2024	Practical activity / demonstration / laboratory	By teachers and company
26.02.2024 – 16.03.2024	Company Visit	and theorical lessons about company production
18.03.2024 – 27.04.2024	Practical activity / demonstration / laboratory	about sustainability challange. Pratical activity and laboratory about ideas from students discussion.



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CASE HISTORY 3.

Company: DOLEJSI MODNI GUMBI *d.o.o.* – Since 1938, it has been producing buttons and fashion accessories in synthetic and natural materials, based in Šempeter in Savinjska dolina (Slovenia).

Combined VET Provider: SIC, Strokovni izobraževalni center di Lubiana (Slovenia)

Production processes presented:
button manufacturing
Machinery/equipment/tools presented:
processing of cut buttons.

…from idea to button development

Plastic scraps from button trimmings:

Plastic pellets:

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CASE HISTORY 4.

Company: TOKIĆ, Leading retail chain for automotive parts (Croatia).

Combined VET Provider: SIC, Strokovni izobraževalni center di Lubiana (Croazia)

Date	Type of activity (choose from drop down menu)	More information
11.01.2024.	Company Visit	presentation about the Tokić company, warehouse tour for students involved in GS4VET
11.01.2024.	Launch of sustainability challen…	launch 2 kinds of sustainability challenge by the company
11.04.2024.	Lesson about sustainability	theoretical lessons by teachers in our school
08.04.2024.	Launch of sustainability challen…	launch third kind of sustainability challenge by the company, in our school (teachers and company agreed that this will be case study)

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Examples of sustainability challenges posed by companies to students in the Erasmus+ Green Skills 4 VET project:

AGRICULTURE: Designing ecological infrastructures for vineyards and orchards. The challenge is to discover new methods for reorganizing agricultural ecosystems and reducing the use of phytochemicals. Certain insects can control pests and enhance pollination. Students will construct hedgerows, ground covers, and insect shelters to rear beneficial insects as a substitute for pesticides.

MECHANICS (specific sector: food refrigeration):

a) Reducing the environmental impact of refrigeration processes: Research into new eco-friendly refrigerants with sustainability, safety, and low environmental impact; energy savings in the system.
b) Upstream sustainability (carbon footprint of system construction – energy and waste): Study the carbon footprint of each component of the system.
c) Impact of maintenance/service on sustainability: Study the impact of maintenance and find solutions to reduce it (including remote assistance).
d) Impact of logistics on sustainability: Find solutions to optimize transportation and packaging.

TEXTILES-FASHION: Using plastic pellets for a new useful product: The challenge is the waste generated during button production. How can we create value from this waste? How can we convert these wastes into a useful product? Students will use plastic pellets as fillers and are already working on prototypes for commercial products, such as a doorstop, a mouse pad, a weighted blanket, or an exercise roller.

TRANSPORT AND LOGISTICS SECTOR: Transition from motorized vehicles to electric vehicles for last-mile delivery. Given that TOKIĆ delivers approximately 2,500 packages per day from its branch to customers, the company is considering reducing distribution costs by replacing internal combustion engine vehicles with electric ones. Students are tasked with finding an appropriate replacement for the existing vehicles in terms of vehicle type, cargo capacity, range per charge, availability of charging points, and an estimate of investment and savings.

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Activity 3: **Case histories of sector-specific case study design**

Below are some examples of the design grid and content for the educational case on environmental sustainability at the intra-sectoral level.

CASE HISTORY 1.

Title of the didactic/ teaching case	**Transition from motorized vehicles to electric vehicles in last-mile distribution**
Target Students	*Study course:* **Traffic management technician (16 years)**
Curricular subjects involved Teachers involved	*Road vehicles and Work-Based Learning (2 teachers)* *Traffic Ecology (1 teacher)* *Freight Transport (1 teacher)*
Entry knowledge & skills	***What do the students need to know to take part in the activity?*** They need to understand how Otto and Diesel engines work, the composition and environmental impact of harmful exhaust gases, and the basics of electric vehicles.
Phases of the experimentation (Flipped classroom)	*Please describe:* ***1. Individual study*** *What kind of resources/documentation will the students be given?* *Learning e- mobility* *https://ec.europa.eu/programmes/erasmus-plus/project-result-content/5ed45e21-15a4-4b04-b1c3-30e589c0f114/LEMO%20prirucnik%20hrv.pdf* *10 best budget electric vans – review* *https://youtu.be/rXpCbBhDXz4?si=cvdj6x84UN6H4Hu7* *Electric vehicle charging basics* *https://youtu.be/4cVWy4yrB3E?si=JyVHBtPiU1edNKgx* *EV friendly podcast*

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	https://youtube.com/playlist?list=PLw6X6v2Bhn5CvhACHb44h6bYnnPzw_QDY&si=ZAzVgnEb48-4GTrS *How green are the electric cars?* https://youtu.be/Chp9VlSs25c?si=agIvvY8ZVgzCVLPg *How an electric car works?* https://youtu.be/tJfERzrG-D8?si=x8b_HJoNGNO1VEgg *Hidden cost about electric cars* https://youtu.be/T7fGDw7U2Wg?si=R3TvQstyl1jjclKW *Electric cars – teachers ppt*  *2. Lab phase Activities planned Equipment & tools* ***Activities planned**:* Students will need to: - Find a suitable electric vehicle replacement for the existing vehicle in terms of vehicle type, cargo capacity, and range per charge. - Check whether each branch can provide charging points. - Determine the investment cost. - Calculate the potential savings.
Organization of the experimentation	***Are the students going to work in groups?** Which criteria to form the groups? Which will be the role of the teacher(s)?* *Are you going to involve the company technicians too at some point?* Students will work in pairs and in self-formed groups. Teachers will act as mentors, coordinating the phases and providing step-by-step instructions. If necessary, we will also involve company technicians.
Learning objectives	***What do you expect/wish the students will be able to do/know after the experimentation?*** - Work in pairs/groups - Problem solving - More attention to the environment

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Expected outcome	***What kind of practical result are you asking your students to create/produce?*** Students will be able to explain and discuss questions such as: - Is charging an electric vehicle cheaper than buying fuel? - Are electric vehicles cost-effective? - How and where can I charge an electric vehicle? - Which electric vehicle should I choose? - What range do I need, and how frequently? They will be able to compare traditional vehicles with electric vehicles, understand sustainable economic management, and analyze the initial investments required for charging infrastructure.

CASE HISTORY 2.

Title of the didactic/teaching case	**Construction of experimental prototype of refrigeration system and implementation of temperature electronic thermostats.**
Target Students	*Study course :* **Vocational (Mechanics) – Scientific lyceum** *Age :* **17/18 years old**
Curricular subjects involved Teachers involved	**Physics, Maths, Electronics, Civics education**
Entry knowledge & skills	***What do the students need to know to take part in the activity?*** Basic skills in physics and maths, be aware of sustainability issues, fundamentals in thermodynamics, rules of conduct in lab.
Phases of the experimentation (Flipped classroom)	*Please describe:* 1. ***Individual study*** ***What kind of resources/documentation will the students be given?*** • *Files from the company.* • *"La fisica dei cambiamenti climatici – Romeni" book (summer reading).* • *https://youtu.be/F0Q0YPyOTgI?si=XHwhN5TkJPEcV0Rp (Mini Frigo Fai da te) With Peltier cell* 2. ***Lab phase****:* *Build a refrigerator model to show the students how it works and carry out scientific-technological measurements and experiments (for example absorption, efficiency and temperature measurements).*

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	First step**: NTC thermometer construction (calibration and construction of the system) [NTC is the sensor that reads - NTC stands for "Negative Temperature Coefficient". Electrical resistance decreases exponentially with increasing temperature.* ***Second step**: Peltier electrical system (fridge) with construction and temperature control (PWM a relais - Arduino) *** ***Third step**: Gas refrigerator construction* ***Activities planned*** *1. individual study (April and May)* *2. lab and tests (September and October)* *3. final relation/presentation/video (October)* ***Equipment & tools*** ***Electric fridge:** Electric power supply, Peltier with heatsink, external heatsink with fan, aquarium pump, box* *(Translate: Alimentatore elettrico, Peltier con dissipatore, dissipatore esterno con ventola, pompa d'acquario, box)* ***Gas fridge**: gas, compressor, evaporator, condenser, lamination valve, control electronics, box.* *(Translate: gas, compressore, evaporatore, condensatore (serpentina di), valvola di laminazione, elettronica di controllo, box.)*
Organization of the experimentation	***Are the students going to work in groups? Which criteria to form the groups?*** *Students will work in groups. The groups are heterogenous with students from different study course and with different abilities.* ***Which will be the role of the teacher(s)?*** *Teachers will coordinate the phase, provide students with materials and instructions step by step.* ***Are you going to involve the company technicians too at some point?*** *Yes, if it is necessary, the technicians could help students to understand how the refrigeration system works.*
Learning objectives	***What do you expect/wish the students will be able to do/know after the experimentation?*** *-work in groups*

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	- problem solving *- make observations and experimentations, identify issues and draw conclusions that are based on empirical facts.* *- specific technical contents of both thermodynamics and operation of refrigeration systems* *- more attention to the environment*
Expected outcome	***<u>What kind of practical result are you asking your students to create/produce?</u>*** *-Final relation* *-Video to show the phases of the case study* *-Students will be able to discuss critically some questions such as "How can I make my fridge more efficient? Or Which cycle saves the most?". They'll ask themselves about the various parameters involved and they'll deduce conclusions.*

CASE HISTORY 3.

Title of the didactic/teaching case	**The use of plastic granules for a new, useful product**
Target Students	***Study course - fashion designer*** *(15 – 18 years)*
Curricular subjects involved Teachers involved	*Practical lessons,* *Pattern drawing,* *Technology,* *Aesthetics,* *Sustainable development*
Entry knowledge & skills	***What do the students need to know to take part in the activity?*** *Awareness of sustainable ecology in the textile industry and general, knows how to sustainably use available materials, can draw a cut, imagines the product spatially*
Phases of the experimentation (Flipped classroom)	*Please describe:* 1. ***Individual study*** *What kind of resources/documentation will the students be given?* *The students received an explanation about sustainability and the global issue of residual waste in production.*

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	They received instructions and encouragement to create a new product using plastic granules from the button company. *2.* ***Lab phase*** *- sketch drawing, technological process, tailoring* *Activities planned - production of a prototype of a new useful product (waste plastic granules as filler)* *Equipment & tools - textile workshop, sewing equipment, sewing machines, working material material (remnants of fabrics), plastic granules from Dolejši company*
Organization of the experimentation	***Are the students going to work in groups? Which criteria to form the groups?*** • *Yes in groups. Students formed groupes by them self* *Which will be the role of the teacher(s)?* • *To guide them and be mentor to them.* ***Are you going to involve the company technicians too at some point?*** • *Maybe, if we decide to make decorative products that do not include fabrics. The students also gave interesting ideas for making products for furnishing and decorating the home (clock, tray, plinth...). Dolejši would help here, with the company's equipment, where the granules would be melted, poured into models or added to the mass for making buttons.*
Learning objectives	***What do you expect/wish the students will be able to do/know after the experimentation?*** Students will be aware of their environment. They will raise and spread awareness among their peers, to think and react sustainably. They are innovative in the production of new textile products, courageous and self-confident in operating in their field.
Expected outcome	***What kind of practical result are you asking your students to create/produce?*** We expect a products that will be satisfactory for everyday practical use and at the same time contain plastic granules, which represent a large waste and a burden to the button company Dolejši.

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Basic Sitography

This section makes no claim to be exhaustive. It lists the fundamental sources from which to start for further exploration and research to support VET providers and companies that are engaging for the first time in an Erasmus+ project in the form of a Cooperation Partnership (KA220-VET action) to jointly address both educational and productive challenges related to environmental sustainability.

Erasmus+

https://erasmus-plus.ec.europa.eu/it
https://www.erasmusplus.it/

Erasmus+ Project Platform
https://erasmus-plus.ec.europa.eu/projects

National Agencies for Youth in Europe
https://youth.europa.eu/solidarity/organisations/contact-national-agencies_it

National Erasmus+ Offices
https://erasmus-plus.ec.europa.eu/it/contacts/national-erasmus-offices

INDIRE – National Institute for Documentation, Innovation, and Educational Research
https://www.indire.it/
https://www.indire.it/webinar-biblioteca-innovazione/
https://www.indire.it/didattica-a-distanza-per-docenti-e-studenti/
https://innovazione.indire.it/avanguardieeducative/

e-Twinning – European Platform for School Education

https://school-education.ec.europa.eu/en/etwinning
https://etwinning.indire.it/

EPALE – European Electronic Platform for Lifelong Learning
https://epale.ec.europa.eu/it

Eurydice – Network on Organization/Functioning of Educational Systems in Europe
https://eurydice.eacea.ec.europa.eu/

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Sustainable development, environment, and green skills:

European Green Deal
https://www.consilium.europa.eu/it/policies/green-deal/

The 17 Sustainable Development Goals
https://sdgs.un.org/goals

https://www.consilium.europa.eu/it/policies/climate-change/

Intergovernmental Panel on Climate Change (IPCC)
https://www.ipcc.ch/

International Energy Agency (IEA)
https://www.iea.org/

United Nations Framework Convention on Climate Change (UNFCCC)
https://unfccc.int/

European Environment Agency (EEA)
https://www.eea.europa.eu/en

World Resources Institute (WRI)
https://www.wri.org/

EU Council Recommendation on Learning for the Green Transition and Sustainable Development.
https://education.ec.europa.eu/it/focus-topics/green-education/learning-for-the-green-transition

Green Comp: The European Framework for Sustainability Competences
https://joint-research-centre.ec.europa.eu/greencomp-european-sustainability-competence-framework_en?prefLang=it&etrans=it

European Year of Skills 2023
https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-year-skills-2023_it

European Skills Agenda
https://ec.europa.eu/social/main.jsp?catId=1223&langId=en

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