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Introduction



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Background & Rationale

SMEs are often referred to as the backbone of the European economy. They represent over 99% of all businesses in the EU and provide two-thirds of the total private sector employment. In the European Union, more than 20 million SMEs create jobs, generate wealth, and contribute to innovation and growth. They are essential for fostering competitiveness and entrepreneurship.

Given their central importance to the European economy, it is clear that SMEs have a significant impact in terms of environmental, social, and governance (ESG), in both positive and negative ways. While SMEs produce 30% of European renewable energy and some are innovation leaders in reducing greenhouse gases, the sector on the other hand is responsible for 64% of Europe's industrial pollution. SMEs also need to improve regarding social and governance issues; for example, only a few have formalised corporate governance structures, and the share of temporary contracts is significantly higher in SMEs than in large companies.

The Vocational Education and Training Sector (VET) can play a major role to support SMEs to overcome their specific ESG related challenges. To do so, the VET sector needs to be enabled and equipped with the training materials needed to promote ESG awareness & ESG risk literacy in SMEs. In turn, this will allow them to train the sector to address environmental issues, create

safer and fairer workplaces, promote diversity and inclusion and to improve corporate governance, anti-corruption and business ethics. In addition, ESG-related risks and implementing ESG reporting standards are main fields of support that the VET sector needs to be enabled to provide to SMEs (4).

PEARL (Enabling VET to Promote ESG Awareness & ESG Risk Literacy in SMEs) is an ERASMUS+ funded project that aims to empower VET organisations, trainers and educators to promote ESG awareness and ESG risk literacy in SMEs in order to enable the sector to reduce ESG related risks, increase their competitiveness, improve their ESG Impact and reduce their environmental footprint. The project will provide the VET sector with knowledge, materials and tools to inform and train SMEs and will thus enhance the important role of the VET Sector for SMEs and for the success of the European Green Deal and related strategies and initiatives

Objectives of the Knowledge Framework

The PEARL Knowledge Framework aims to define and elaborate on the essential competences, skills, and tools needed by VET professionals and SMEs to engage meaningfully with ESG topics. Grounded in evidence from our research activities and guided by expert input, the framework adopts a bottom-up, co-creation process that ensures the inclusion of core ESG areas.

While drawing on established EU competence models—such as GreenComp, EntreComp, and DigComp—the framework prioritizes clarity, simplicity, and practical relevance, especially for micro and small enterprises with limited time, financial resources, and technical expertise.

Our goal is to provide a flexible and scalable structure that VET providers can adapt to

different levels of SME readiness. By offering a hands-on, step-by-step approach to ESG learning, the PEARL framework supports SMEs in building awareness, identifying risks, and taking action—no matter their starting point. Ultimately, this framework is designed to promote a realistic and sustainable ESG mindset across the European SME ecosystem.

03

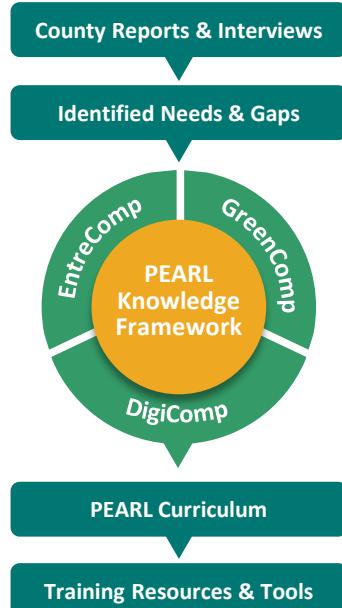
Methodological Approach

All PEARL resources are based on intensive co-creation processes and expert involvement, building the foundation of the knowledge framework and the curriculum.

This way we ensure consistent alignment of the resources with the knowledge needs, challenges and risks of ESGs.

“The PEARL Framework is the foundation for the project. ”

The framework will include three interconnected facets:



01

Knowledge Framework

Development of a learning framework tailored to the specific needs of SMEs. The learning and skills need identified during the application phase will be specified in an international expert survey and summarised in an adapted SME ESG VET Learning Framework.

02

Curriculum

Adaptation of the Knowledge Framework into a comprehensive, modular ESG curriculum for small and medium-sized enterprises. It is designed so that VET organisations can implement the curriculum entirely as a stand-alone course or partially into existing programmes. The curriculum includes learning objectives, module structure and lesson plans.

03

Training Resources

The curriculum is transferred into training modules. The training resources are supplemented by tools, accompanying materials / further reading, assignments etc. For VET educators, a VET package with relevant background knowledge is provided per module. The materials are also prepared as OERs for self-study. This framework has been developed based on findings obtained from country reports and semi-structured interviews, as well as analyses of these findings. The results of these analyses serve as a basis for identifying SMEs' training needs and competency gaps in the ESG area and designing appropriate learning and competency frameworks.

*The PEARL Framework is open resource and is designed to be **flexible and responsive to the learning needs of a diverse group of target groups** with the central aim being to provide personalization of learning paths. It recognises that individual characteristics and needs will vary depending on: socio-economic background; educational attainment; reason for setting up the business; business size; business performance; and plans for expansion*

Target groups and beneficiaries include:



01

VET Educators working with SMEs and their workforce

The project results and resources are primarily aimed at VET Organisations, Trainers and Educators working with micro, small and medium enterprises and their workforce. The innovative resources will enable the VET Sector to promote ESG Awareness and ESG Risk Literacy in SMEs and to provide innovative specific support, education and tools to the sector in order to address the sector specific ESG related challenges and knowledge needs and skills gaps. The project will provide the necessary background knowledge, specific training courses and toolboxes. Those resources will be supported by the innovative ESG Risk Assessment APP, allowing SMEs to identify company specific ESG related Risks and providing in-depth feedback and strategies to mitigate those.



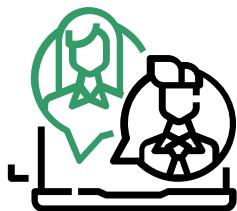
02

Adult and Entrepreneurship Educators

ESG Expertise is a relevant new skill set highly demanded by the labour market and very relevant for Start-Ups who often struggle to meet the demands of ESG related legislation. The project resources will also be disseminated to adult and entrepreneurship educators across Europe. The modular and flexible nature of the resources also allows these target groups to implement the materials in whole or in part. Through our networks, we will also directly involve this target group in the dissemination of the materials.



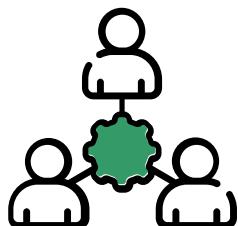
Target groups and beneficiaries include:



03

Micro & Small and Medium Enterprises and their workforce

Micro & Small and Medium Enterprises and their workforce are the primary beneficiaries of the resources and results produced. They profit from innovative training and support from the VET Sector or can use the materials in self-study. Thus, they get access to relevant knowledge and tools, specifically designed to match their structural challenges and specific knowledge needs regarding ESG Compliance and ESG Risks - taking into account the diversity of the sector. The innovative ESG Risk Assessment APP allows them to identify weak spots and provides individual and specific recommendations and measures to increase the crisis resilience. The complementing knowledge resources provide the knowledge needed to implement those.



04

Other Target Groups

There are other indirect target groups that will benefit from the resources including:

- **Society:** By increasing the crisis resilience of the CCI sector, the project contributes to securing businesses and jobs, economic growth and innovation and preserving cultural diversity in Europe.
- **Project partners:** will acquire new strategies, tools and methods for improving the effectiveness of their services. They will improve their own competences in knowledge sharing and strategic relationship building and have a clear understanding of how to sustain and grow the project in the long term.



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ESG Principles and Their Relevance to SMEs

ESG encompasses all *non-financial risks and opportunities* involved in a company's daily operations.

Therefore, this concept encourages businesses to view sustainability as a strategic tool for creating value. The three main components that constitute ESG are detailed with examples in *Table 1* (derived from Li, et al., 2021; EBA, 2021)

"ESG is a holistic approach that ensures businesses consider their social and environmental responsibilities rather than focusing solely on profitability."

Environmental	Social	Governance
<ul style="list-style-type: none"> • Energy usage & efficiency • CO2 emissions reduction • *Water management • Pollution & air quality • Waste management <ul style="list-style-type: none"> • Materials • Nature 	<ul style="list-style-type: none"> • Health & safety • Employee working conditions & pay • Equality, diversity & inclusion • Engagement with local community • Product safety & standards/customer welfare • Supply chain integrity 	<ul style="list-style-type: none"> • Ethical standards • Risk management <ul style="list-style-type: none"> • Compliance • Shareholders rights • Accounting integrity • Conflict of interest

Table 1. ESG Factors

In addition to national regulations existing in many countries today, EU law also obliges companies above a certain size to disclose information on the risks and opportunities arising from social and environmental issues, as well as the impacts of their activities on people and the environment. Although SMEs constitute

approximately 99% of the European economy and provide two-thirds of employment, the vast majority of them are still not fully integrated into ESG practices. The main reasons for this include financial and human resource constraints, lack of knowledge, and the complexity of regulatory burdens.

Nevertheless, ESG practices offer many benefits to SMEs (Aziz & Alshdaifat, 2024; Gürlevük, 2024; Mitra & Bui, 2024):

- Reducing potential financial risks by addressing environmental and social issues
- Increasing operational efficiency and lowering costs through process improvements such as energy and water savings and waste reduction
- Expanding market potential by being preferred more by ESG-conscious investors
- Increasing access to credit and investment opportunities, as banks and investment funds perceive companies with strong ESG performance as lower-risk
- Strengthening employee retention, as the desire to work in socially responsible companies is steadily growing, especially among younger employees



In this context, Green VET-Education plays a critical role in helping SMEs counter their increasing vulnerability to ESG risks and meet their growing demand for competent personnel in ESG matters. The PEARL project also aims to strengthen the VET sector to address these ESG knowledge gaps. Our goal, based on state-of-the-art digital learning resources, is to seamlessly integrate practical ESG literacy into VET programs. This approach enhances the

resilience and adaptability of SMEs in an evolving competitive environment and promotes sustainable business practices. Specifically within the scope of the project, the widespread adoption of ESG practices in SMEs aims not only to provide corporate benefits but also to contribute to macro-level policy objectives such as the European Green Deal and the UN SDGs.

ESG Risk Landscape and Challenges for SMEs

The **ESG risk landscape** includes common risks that companies have anticipated and managed for many years, such as **employee health and safety, natural disasters, emergency preparedness, and supply chain planning**

The ESG risk landscape includes common risks that companies have anticipated and managed for many years, such as employee health and safety, natural disasters, emergency preparedness, and supply chain planning. However, it also encompasses emerging risks such as biodiversity loss, drought, privacy and data protection challenges, and the energy transition.

As these risks are increasingly monitored by company stakeholders, ongoing economic volatility and rising interest rates have further prompted boards of directors to reassess their priorities and investment plans. The ESG risks faced by SMEs are also multidimensional, spanning environmental, social, and governance domains.

01

Environmental Risks:

Environmental performance encompasses a company's use of natural resources, its emissions, waste management, and overall impact on ecosystems. SMEs, due to their generally more limited financial and technological resources, face greater challenges than large enterprises in preventing and managing environmental risks. However, given their significant share in the economic system, the environmental damage they cause is also considerable. Because of their short-term profit objectives, SMEs tend to make limited

technological investments, and their energy efficiency and rates of renewable energy use are generally low. Failure to effectively manage environmental risks can expose SMEs to legal sanctions, interruptions in production processes, increased costs, and loss of customers. Moreover, poor environmental performance creates a high-risk perception among investors and financial institutions, making it more difficult for SMEs to access capital. (Andersen & Skjoett-Larsen, 2009; Revell, Stokes & Chen, 2010; Omowole et al., 2024).

02

Social Risks:

Social performance is defined by the relationships a business establishes with both internal and external stakeholders. SMEs, due to their limited resources and smaller organizational structures, face greater challenges in managing social risks. The absence of written human resources policies, social auditing mechanisms, and procedures aligned with international standards increases the impact of social risks in SMEs. Inadequate occupational health and safety measures, low wage

policies, excessive working hours, and precarious employment practices are key areas of risk. Non-compliance with fundamental labor rights harms both the company's reputation and its operational continuity. Failure to effectively manage social risks may lead to higher employee turnover, reduced labor productivity, reputational damage, customer loss, and ultimately, weakened financial performance in the long term (Chang, 2021; EBA, 2021).

03

Governance Risks:

In general, governance refers to how a company manages its decision-making processes, corporate structure, ethical standards, and stakeholder relationships. However, SMEs are more exposed to governance risks due to being typically family-owned, having limited financial resources, and operating with small management teams. Although a flat organizational structure provides flexibility in decision-making, it also increases risks such as lack of oversight, conflicts of

interest, and unethical behavior. In many SMEs, decision-making processes are mostly carried out by a narrow group of managers or a single leader, which leads to insufficient information flow to stakeholders. Moreover, most SMEs lack an effective internal audit system, which increases the risk of errors and misconduct. Ineffective control mechanisms can result in financial losses, reputational damage, and legal sanctions (EBA, 2021; Feng & Saleh, 2024).

03

Regulatory and Market Drivers

In recent years, the EU has introduced comprehensive regulations that replace voluntary sustainability policies with mandatory integration of ESG into businesses' strategic and operational processes.

Although these regulations primarily target large corporations, they also significantly affect SMEs indirectly. This is because such regulations, alongside market demands, play a critical role in shaping companies' ESG performance.

01

The Corporate Sustainability Reporting Directive (CSRD):

The EU's sustainability reporting directive, which went into effect in 2024. According to the directive, businesses must disclose their ESG performance in a way that is open, comparable, and auditable. CSRD aims to ensure that stakeholders can evaluate not only companies' financial performance but also their sustainability-focused

performance. Although this regulation initially targets large enterprises, it also applies to SMEs that exceed certain size thresholds. Moreover, SMEs within the supply chain are increasingly expected to provide transparent data and comply with reporting obligations (EU, 2022).

02

The EU Taxonomy:

The EU Taxonomy Regulation went into effect in 2020 with the goal of ensuring that investments are allocated to sustainable projects and activities in order to meet the 2030 climate and energy targets. Which economic activities are deemed environmentally sustainable is determined by the EU Taxonomy classification system.

Its main goal is to direct financial resources toward truly sustainable endeavors by mandating that companies openly disclose their environmental impact. By doing this, financial institutions and investors can steer clear of the dangers of "greenwashing" (EU, 2020).

03

Corporate Sustainability Due Diligence Directive (CSDDD):

As part of the EU's sustainability policy framework, the CSDDD was introduced to expand corporate responsibilities concerning environmental and human rights impacts. The CSDDD obliges companies to take responsibility not only for their own operations but also for human rights and environmental impacts throughout their entire supply chains. This regulation

introduces a risk-based approach to preventing social and environmental violations across the supply chain. Although the CSDDD does not directly target SMEs, it places indirect pressure on them, as large corporations are increasingly expected to demand ESG compliance documentation or reports from their SME suppliers (EU, 2024).

04

Market Drivers:

ESG-focused financing models and responsible investment are gaining popularity as a result of national and EU-level ESG regulations. Companies with strong ESG compliance are now given priority in the portfolios of international investors. Furthermore, a company's ESG performance is now a crucial factor in determining its ability to access sustainable finance instruments like green bonds and sustainability-linked loans. In addition, younger consumer segments are more inclined to choose brands with strong ESG credentials. This growing demand makes

ESG performance not only an ethical responsibility, but also a commercial competitive advantage. Large multinational companies are increasingly requiring SMEs within their supply chains to comply with ESG standards. This is especially evident in sectors like automotive, textile, and retail. Non-compliance can lead to contract terminations and loss of market access. Furthermore, ESG performance has become a key factor in brand reputation and corporate valuation. Companies with robust ESG practices tend to be more resilient during crises and are able to recover faster.



Role of VET in Enhancing ESG Capacities

The VET sector is essential for equipping SMEs with the knowledge, skills, and competencies needed to address ESG challenges.

Driven by EU regulations, ESG principles are becoming core components of business strategies, turning sustainability into a major competitive advantage.

While large corporations generally have sufficient resources and expertise to manage this transition, SMEs often struggle due to limited technical knowledge, financial constraints, and weak organisational structures. Semi-structured interviews conducted in five countries within the PEARL project reveal that SMEs, especially micro and small enterprises, largely lack formal ESG strategies and have low ESG awareness.

This highlights the urgent need for systematic educational interventions to close knowledge gaps, improve ESG risk literacy, and support strategic transformation. Structured, modular, and context-specific ESG training programs - like those offered through the PEARL Knowledge Framework and Curriculum - address these needs by providing tailored learning modules. These cover ESG fundamentals as well as practical guidance on risk assessment, strategy development, reporting, and sustainable finance.

“Integrating ESG competencies into VET curricula enables SMEs to view ESG as essential for competitiveness and long-term viability. Additionally, including horizontal skills such as systems thinking, ethical decision-making, and responsible leadership supported by frameworks like EntreComp, GreenComp, and DigComp strengthens the VET offering. “

These competencies foster a sustainability-oriented entrepreneurial mindset and help SMEs adapt to changing regulations. Beyond technical knowledge, VET also drives cultural change in SMEs by engaging leaders and employees through experiential, participatory learning. The PEARL "Train-the-Trainer" model exemplifies this by equipping instructors to deliver impactful ESG training, creating a multiplying effect across local and regional SME ecosystems. Flexible delivery formats (classroom, hybrid, and self-paced online learning) make ESG training accessible

and inclusive, accommodating diverse needs across industries and regions. Diagnostic tools like the PEARL ESG Risk Assessment Application help SMEs evaluate and enhance their ESG performance, increasing resilience to market, regulatory, and reputational risks. Overall, VET is a critical enabler for building ESG capabilities in SMEs. By addressing knowledge and skill gaps, it supports a more resilient, inclusive, and sustainable European economy through targeted training, digital resources, and strategic support.

03

Research Insights

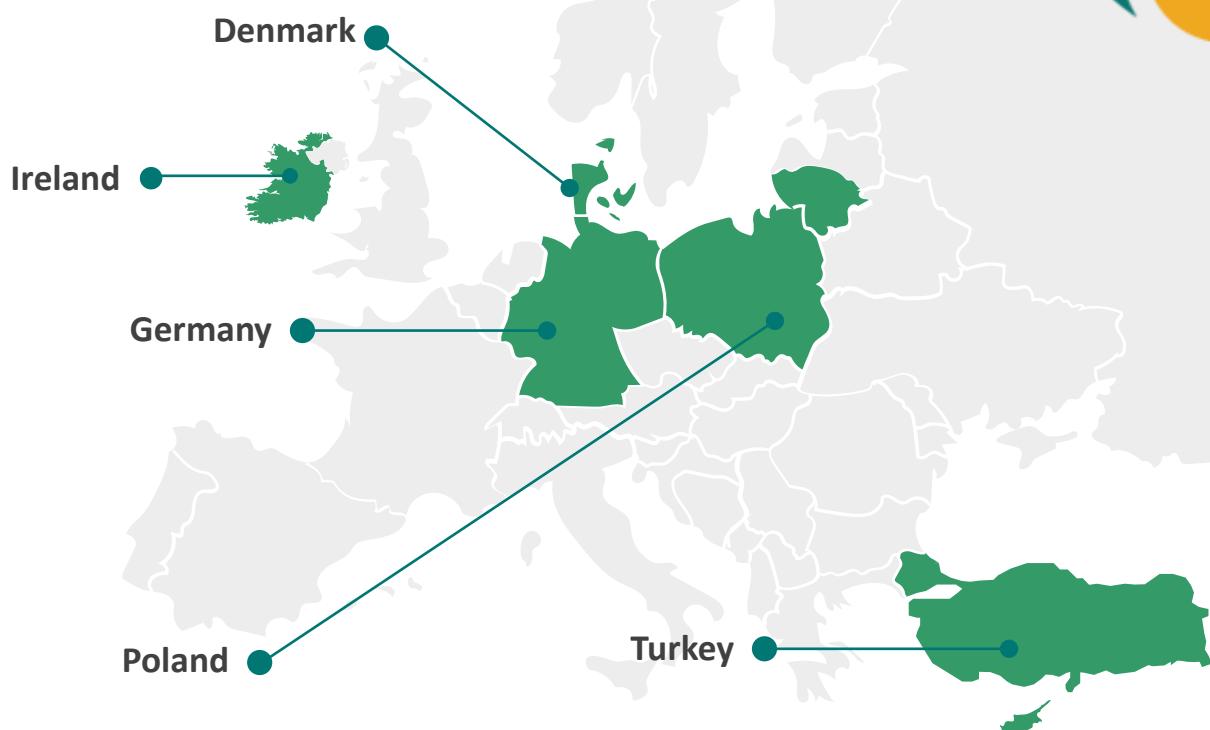


Drawing on both country reports (desktop studies) and semi-structured interviews carried out in **Türkiye, Ireland, Germany, Poland, and Denmark**, this section offers a **comparative and detailed overview of ESG management among SMEs**, highlighting **best practices, gaps, and future challenges**.

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Country Reports: Comparative Summary and Key Findings

The primary purpose of country reports is to capture the **current state of play, experience, and expertise**, regarding ESG and SMEs in partner countries and **identify best practices and support gaps**. These country reports will be compiled to produce a comparative report to help formulate the knowledge on ESG business support expertise and experience.



The **country report** provides a comparative analysis of **ESG management practices** across **five countries** - *Turkiye, Ireland, Germany, Poland, and Denmark* - and highlights how **SMEs in these countries are navigating the increasing demand for ESG integration** including:

01

Government policy, initiatives and agencies

General and specific to ESG management in SMEs;

02

Education and training provision

General and specific to ESG management.

03

Future direction and outlook/gaps/challenges

ESG management and education in SMEs.

In Turkiye, SMEs face challenges in adopting ESG standards due to limited resources and awareness, despite government support like the Green Deal Action Plan. In Ireland, SMEs are underprepared for mandatory ESG reporting. In Germany's SMEs are integrating ESG practices,

but get specialised VET training to help them meet evolving EU regulations. In Poland, SMEs' low preparedness for ESG risks their competitiveness. In Denmark, while government initiatives support SMEs' green transition, resource limitations persist.



“The overall conclusion is that while significant progress has been made across all five countries, substantial challenges remain, particularly in providing practical ESG education and overcoming financial barriers for SMEs. It recommends that governments enhance support structures, simplify regulatory frameworks, and offer more targeted training programs to ensure that SMEs can successfully integrate ESG principles into their business models.”

Semi-Structured Interview Results: Key themes and Findings

The aim for conducting semi-structure interviews across five countries was to capture qualitative in-depth data from SMEs and key informants on the level of awareness, practices, barriers to implementation and knowledge and education gaps in the SME sector.

The semi-structured interviews involve gathering form the following respondents in each country: (Table2)

01

Vocational Education and Training (VET) Professionals

Including Teachers and Educators

02

ESG Risk and Strategy Experts

Experts specializing in Environmental, Social, and Governance (ESG) Risk and Strategy (Business Consultants, Chamber of Commerce, Local Support Agencies).

03

Small and Medium-Sized Enterprise (SME) Representatives

	Turkiye	Denmark	Poland	Germany	Ireland	TOTAL
VET educators	4	5	2	4	5	20
ESG experts	4	-	3	2	2	11
SMEs	4	2	5	4	5	20
Total	12	7	10	10	12	51

Table 2. Respondents of interviews

Table 3 presents the key themes that emerged from the semi structured interviews.

The findings confirm whilst there was a positive response to the sustainability agenda the level of awareness of ESG in SMES is low particularly on the social and governance dimensions. The main drivers for change are management seeking competitive advantage from increased sales or reduction in cost, customers and externally from the demands of the regulatory

framework. There are significant challenges to be dealt with including a skills and knowledge deficit e.g. understanding of ESG; regulations and legal requirements, assessment & reporting, risk management and change management; time and financial constraints and the matching of the sustainability objective with the financial objectives of a business

Themes	Turkiye (N=12)	Denmark (N=7)	Poland (N=10)	Germany (N=10)	Ireland (N=12)	Total (N=51)
Level of awareness						
Level of ESG awareness low	10	5	7	6	11	39
Sustainability conscious	3	6	4	5	7	25
No formal planning or strategy	4	4	9	7	12	34
Main ESG factors impacting on SMEs						
Energy usage	5	6	10	7	10	38
Waste management	5	7	5	4	8	29
Health & Safety	7	5	2	4	8	26
Employee wellbeing	2	7	2	7	4	22
Legal & Regulatory Compliance	6	7	3	8	6	30
The Drivers for Change						
Management Culture & Values	5	7	6	5	4	27
Provides competitive advantage	6	4	6	7	10	33
Employees	5	3	2	2	2	14
Customers	6	7	5	10	10	38
Supply chain	3	7	0	2	1	13
Investors & financial institutions	0	5	0	7	3	15
Government legislation and regulation	5	3	6	4	10	28
Challenges to implementation						
Lack of skills, knowledge & expertise	10	7	9	5	12	43
Resource constraints – time, financial	8	7	9	9	10	43
Competing priorities – operational/profit making	4	5	3	5	11	28
Government supports needed						
Financial support	8	7	7	5	9	41
Awareness & capacity building	6	7	10	5	9	37

Table 3. Key themes arising from the semi-structured interviews

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3.1 Level of Awareness

Respondents' answers to questions regarding Level of awareness focused on three main themes:

01

Low Level of ESG Awareness

02

Sustainability Conscious

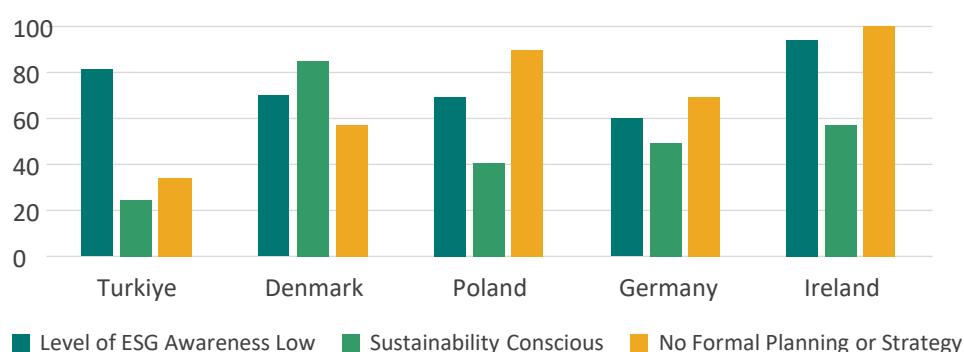
03

No Formal Planning or Strategy

When examining the distribution by country, it is noteworthy that the percentage of participants indicating low ESG awareness is quite high in Turkiye and Ireland, and that the lack of formal plans or strategies is also

widespread in other countries. In contrast, the percentage of participants who stated that they are sustainability conscious is relatively lower in all countries.

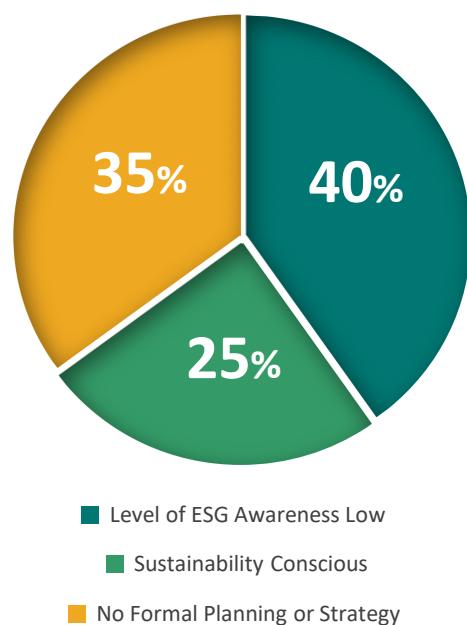
Level of Awareness per Country



This highlights the critical need for raising awareness and developing systematic plans regarding ESG. Looking at the overall distribution, 40% of participants stated that their level of ESG awareness was low, 35% stated that they did not have a formal plan or strategy, and only 25% stated that they were aware of sustainability.

These results show that SMEs have limited basic knowledge on ESG issues and that there is a significant gap between awareness and corporate implementation.

Level of Awareness Total



3.2 Main ESG factors impacting on SMEs

According to participants' responses, **the main ESG factors** affecting SMEs are grouped under **five main themes**:

- 01 Energy Use
- 02 Waste Management
- 03 Health And Safety
- 04 Employee Well-being
- 05 Legal & Regulatory Compliance

These themes are grouped according to the **three main dimensions of ESG**:

Environmental

Social

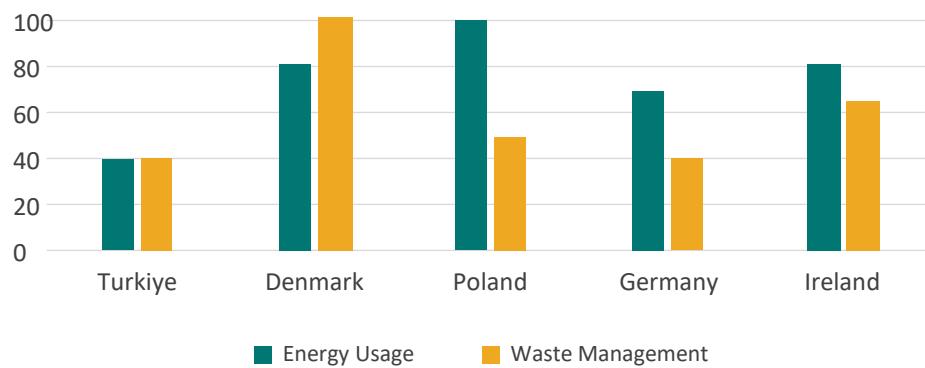
Governance



Among environmental factors, energy use (38) and waste management (29) stand out, while health and safety (26) and employee well-being (22) are important in the social sphere. In the governance dimension, legal and regulatory compliance (30) was the most emphasized theme (Table 3). In all countries, energy use is generally seen to be a priority issue. However, participants in Denmark emphasize waste

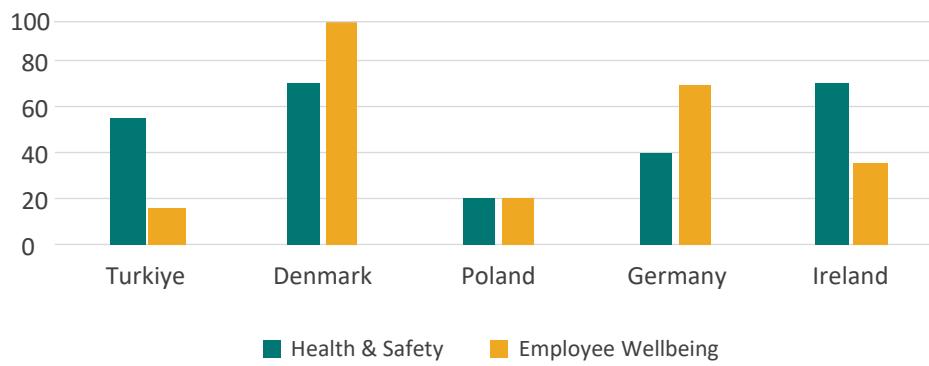
management and employee wellbeing more than participants in other countries in percentage terms. Similarly, the participants in Germany are more likely to emphasize employee welfare as a percentage compared to other countries. Also, in the health and safety category, participants in Türkiye and Ireland emphasize health and safety more in percentage terms.

Environmental



Participants in Denmark and Germany also emphasize legal and regulations compliance more than participants from other countries. While participants in Poland place the highest emphasis on energy use, their emphasis on legal and regulatory compliance lags behind other country participants in percentage terms.

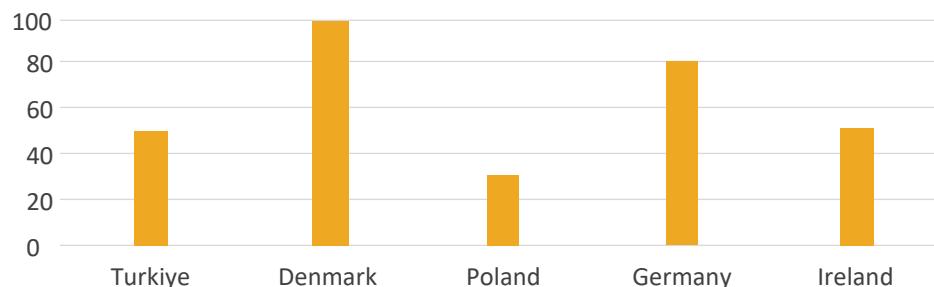
Social



Overall, environmental and governance issues such as energy use and legal compliance are high on the agenda of SMEs, but awareness and systematic implementation of social issues (e.g., employee well-being) are not yet sufficiently strong. This situation indicates that ESG issues are still being addressed in a fragmented manner by most SMEs and have not been transformed

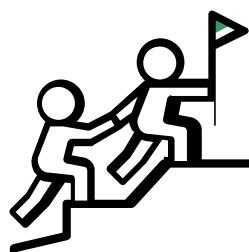
into a comprehensive strategy. These findings clearly highlight the importance of the capacity-building activities developed by the PEARL project to strengthen SMEs' environmental responsibilities, improve their social impacts, and enhance their corporate governance processes

Governance – Legal & Regulatory Compliance



3.3 The Drivers for Change

According to respondents, the main drivers for change in SMEs can be grouped into seven main themes:



- 01 Management Culture & Values
- 02 Provides Competitive Advantage
- 03 Employees
- 04 Customers
- 05 Supply Chain
- 06 Investors & Financial Institutions
- 07 Government Legislation & Regulations

Looking at the overall results, competitive advantage (20%) and customer (22%) stand out as the most prominent factors. Management culture and values (16%) and government legislation and regulations (17%) also play an important role in SMEs' ESG transformation. In contrast, employees (8%), supply chain (8%), and

investors & financial institutions (9%) are less emphasized compared to other factors. These results indicate that SMEs are primarily motivated by adapting to external markets, enhancing competitive strength, and complying with legal requirements in their ESG practices.

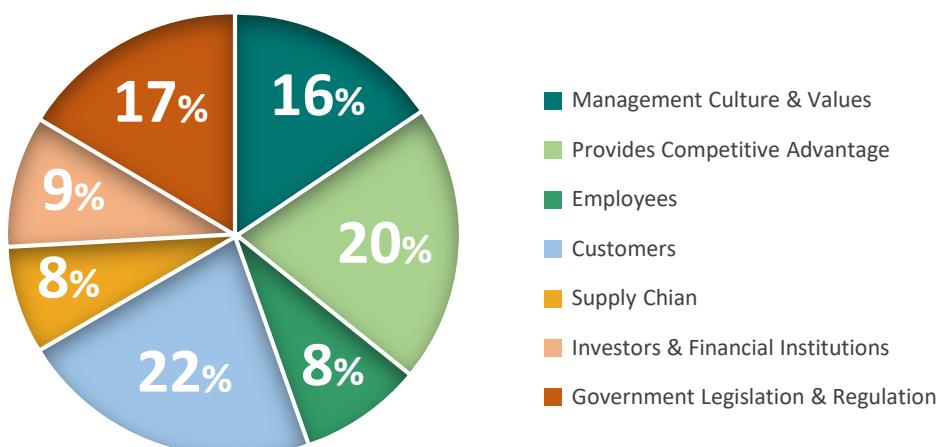
Drivers for Change



When the countries are analyzed in terms of the seven main themes, participants in Denmark and Germany place the highest emphasis in percentage terms on the factors of customer demands and investor/financial institutions. In addition, the statements of the participants in Germany stand out in the provides competitive advantage category together with those of the participants in Ireland. On the other hand, participants in Denmark differ significantly from participants in other countries in terms of percentage in the statements on management culture and values and supply chain.

The **employee factor**, however, remains relatively less prominent across all countries, indicating that internal motivation and **employee-focused strategies** are not yet sufficiently strong in driving ESG change.

Drivers for Change - Total



3.4 Challenges to Implementation

According to respondents, the biggest challenges faced by SMEs in ESG implementation can be grouped into three main themes:

01

Lack of Skills, Knowledge & Expertise

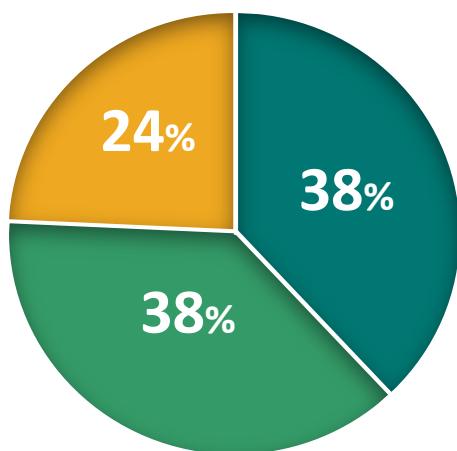
02

Resource Constraints – Time, Financial

03

Competing Priorities – Operational/Profit Making

Challenges to Implementation



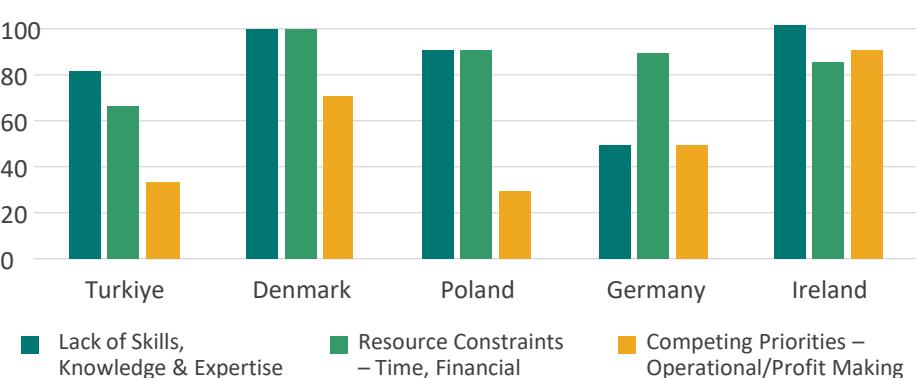
Overall, lack of skills, knowledge & expertise (38%) and time and financial resource constraints (38%) were the most frequently cited barriers. This was followed by competing priorities – operational/profit making (24%). This shows that SMEs need to develop their capacities and secure sufficient resources when implementing ESG processes, and that they may have to put their long-term sustainability goals on the back burner due to daily operational pressures.

- Lack of Skills, Knowledge & Expertise
- Resource Constraints – Time, Financial
- Competing Priorities – Operational/Profit Making

When analysed by country, the emphasis on lack of skills, knowledge and expertise emerges as the most important issue for all country participants, with the exception of participants in Germany. In addition, all participants emphasize the importance of resource constraints - time and financial. Participants in

Ireland and Denmark are evenly distributed across all themes in percentage terms, whereas for participants in Germany, resource constraints are more prominent than other themes. The most important theme for participants in Türkiye is the concept of lack of skills, knowledge and expertise.

Challenges to Implementation



3.5 Government Supports Needed

According to respondents, the basic government support needed by SMEs to implement ESG practices more effectively can be grouped under two main headings:

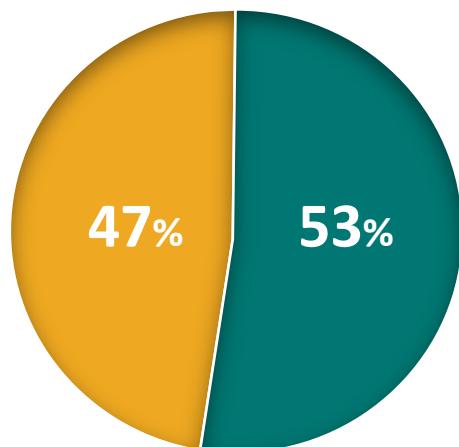
01

Financial Support & Awareness

02

Capacity Building

Government Support Needed - Total



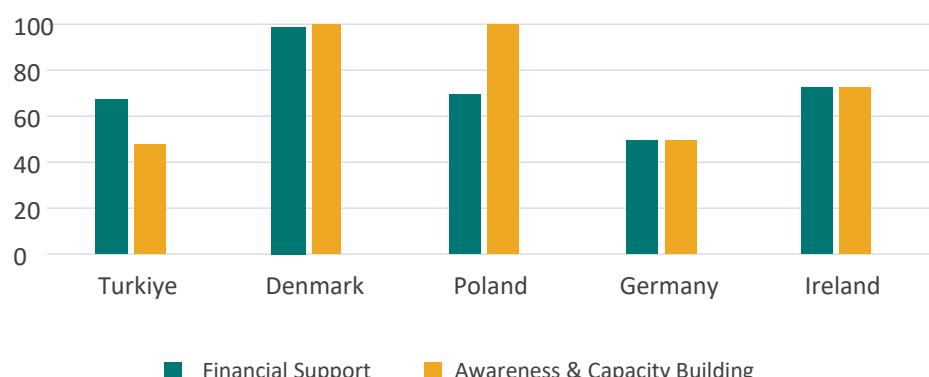
Overall, 53% of participants indicated financial support as a priority need, while 47% emphasized awareness and capacity building. These results show that ESG practices are often delayed or implemented on a limited scale due to a lack of financial resources. However, the lack of capacity development and awareness highlights the need for both knowledge and behavioral change for long-term sustainable transformation in ESG issues.

■ Financial Support
■ Awareness & Capacity Building

When the countries are analyzed, participants in Denmark, Germany and Ireland show a balanced distribution between both themes. However, the percentages show that participants in Denmark and Poland

emphasized awareness and capacity building significantly more than the other countries. On the other hand, the most prominent factor for participants in Türkiye was financial support.

Government Support Needed





“Based on the detailed findings derived from the country reports and semi-structured interview analyses, the PEARL curriculum has been carefully designed to directly address the identified gaps and training needs of SMEs in the ESG domain. Accordingly, the following modules have been developed to provide a comprehensive and targeted learning exercise: Introduction to ESG; ESG Onboarding, Vision and Responsibility; ESG Risk Analysis and Materiality Assessment; ESG Strategy and Implementation; Reporting, Communication and Branding; and Sustainable Financing and Funding Options for SMEs. This modular structure ensures that the curriculum is fully aligned with the practical realities and capacity-building needs highlighted in the research insights, ultimately empowering SMEs to integrate ESG principles effectively and sustainably into their business practices.”

04

Competence Matrix (Knowledge, Skills, Attitudes)



Rooted in educational theory, Knowledge, Skills, Attitudes (KSA) model is recognized as a comprehensive framework for structuring learning and professional development (Maqsood, et al., 2003). Initially associated with Bloom's taxonomy, knowledge represents the cognitive domain, encompassing mental skills and factual understanding. Skills correspond to the psychomotor domain, reflecting practical and manual capabilities, while attitudes relate to the affective domain, addressing emotions, values, and behavioral dispositions (Bloom, 1956; Anderson et al., 2000).

01

Overview of Competence Areas and Expected Outcomes

30

02

Knowledge, Skills, and Attitudes (KSA) per Competence Area

31

Overview of Competence Areas and Expected Outcomes

The Knowledge Framework seeks to define and elaborate on the essential competence areas for **VET Professionals and SMEs within the ESG domain**. This co-creation process ensures the inclusion of **key competence areas** by innovatively merging established frameworks, such as the **GreenComp Framework**, **EntreComp Framework**, and relevant aspects of the **DigComp Framework**. Our ambition is to offer a holistic approach to ESG training tailored for SMEs, ultimately driving a pivotal shift in VET education to address both current and imminent ESG skills and knowledge requirements.

This structured approach ensures that training interventions:

"The PEARL project adopts the Knowledge, Skills, and Attitudes (KSA) model as a foundational approach for defining ESG-related competencies in SMEs. By applying the KSA model, PEARL systematically maps the core ESG competences outlined in EntreComp, DigComp, and GreenComp frameworks to the specific needs of SMEs."

Competencies structured using the Knowledge, Skills, and Attitudes (KSA) model serve as a fundamental basis for the design of the PEARL curriculum and its associated training modules. These competencies define the core capacity areas that SME professionals need to develop in order to effectively integrate ESG principles into their business processes. By outlining what participants need to know (knowledge), how to

01 Knowledge
What professionals need to know



02 Skills
How they should apply it



03 Attitudes
The mindset they should adopt



apply it (skills), and what attitude to adopt (attitude), these competencies ensure that each module is strategically structured and pedagogically grounded. Thus, this framework shapes the content and learning objectives of the modules while ensuring that the curriculum directly addresses the needs and gaps identified in country reports and interview analyses.

Knowledge, Skills, and Attitudes (KSA) per Competence Area

- 4.1 **EntreComp Framework (Entrepreneurial Competences)** Page 31
- 4.2 **GreenComp (Green Competences)** Page 35
- 4.3 **Digcomp (Digital Competences)** Page 38

4.1 **EntreComp Framework (Entrepreneurial Competences)**

The **EntreComp Framework** defines entrepreneurship as a **fundamental, horizontal competence for lifelong learning**, encompassing not only the ability to start a business but also the **capacity to turn ideas into action in different contexts**.

In the PEARL project, EntreComp is used to promote the development of an entrepreneurial mindset that supports ESG integration. Focusing on areas such as creativity, ethical and sustainable thinking, mobilizing resources, planning, and learning through experience, EntreComp enables SMEs and VET professionals to lead ESG

initiatives. SMEs can thus develop innovative and adaptable strategies to drive long-term sustainable change, increasing their competitiveness and resilience. Promoting entrepreneurial competences among individuals and SMEs is central to the EU's Key Competences for Lifelong Learning.

EntreComp identifies 3 interconnected competence areas:

01 Ideas and Opportunities



02 Resources



03 Into Action



Each area includes 5 competences, providing a structured lens to develop entrepreneurial thinking and action. PEARL supports SMEs in embedding ESG principles into their core strategies. The EntreComp framework helps VET

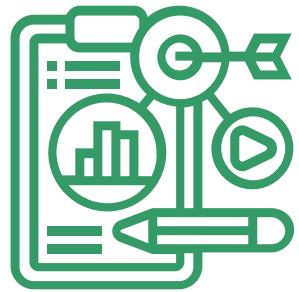
educators and learners build the entrepreneurial capacities needed to navigate ESG challenges, implement sustainable practices, and create long-term value

Below, each competence is detailed with its **Knowledge (K), Skills (S), Attitudes (A), and PEARL Context**, all adapted to an ESG-focused perspective.



Area 1: Ideas and Opportunities

Competence	Knowledge (K)	Skills (S)	Attitudes (A)	PEARL Context
1.1 Spotting opportunities	Where ESG opportunities may exist in your sector.	Finding and selecting simple ESG ideas that could benefit the business.	Curious, willing to try new things.	Helping SMEs spot basic ESG-related opportunities in their daily operations (e.g., energy saving, local sourcing).
1.2 Creativity	Simple and low-cost ways to improve ESG performance.	Trying out practical ESG solutions (e.g., reuse materials, reduce waste).	Open-minded, solution-focused.	Encouraging SMEs to test small, creative ideas to improve sustainability.
1.3 Vision	Why a long-term ESG goal matters for your business.	Setting a few clear ESG goals for the next year.	Future-thinking, realistic.	Supporting SMEs to define achievable, short- to medium-term ESG targets.
1.4 Valuing Ideas	How to judge if an ESG idea is useful or possible.	Comparing ESG ideas to choose the most realistic and valuable one.	Practical, focused on what works.	Helping SMEs evaluate ESG actions based on cost, ease, and impact.
1.5 Ethical and sustainable thinking	Understanding basic ESG values	Making business choices that match ESG values	Responsible, honest.	Supporting SMEs to act ethically and make balanced ESG decisions in daily choices.



Area 2: Resources

Competence	Knowledge (K)	Skills (S)	Attitudes (A)	PEARL Context
2.1 Self-awareness and self-efficacy	Your role and what you can do in ESG.	Understanding limits and building confidence to take ESG actions.	Willing to improve, self-aware.	Helping SME staff see how they can personally contribute to ESG improvements.
2.2 Motivation and perseverance	ESG actions take time and may face setbacks.	Keeping ESG goals on track even when things get difficult.	Determined, committed.	Encouraging SMEs to stay focused on ESG goals despite challenges.
2.3 Mobilising resources	What people, time or budget is needed for simple ESG actions.	Using existing resources wisely for ESG (e.g. electricity use, training).	Practical, team-oriented.	Helping SMEs use available resources efficiently for ESG improvements.
2.4 Financial and economic literacy	Basic ESG-related costs, benefits, and risks.	Making simple financial choices for ESG actions (e.g. energy savings).	Responsible, cost-aware.	Supporting SMEs to assess the business case for small-scale ESG investments.
2.5 Mobilising others	Who needs to be involved in ESG in your business.	Talking to others and getting their support for ESG actions.	Supportive, good communicator.	Helping SMEs involve staff, customers or partners in small ESG efforts.



Area 3: Into Action

Competence	Knowledge (K)	Skills (S)	Attitudes (A)	PEARL Context
3.1 Taking the initiative	How to start a basic ESG action in your business.	Taking simple first steps toward ESG change.	Proactive, can-do attitude.	Helping SMEs begin with small ESG actions, like switching to local suppliers.
3.2 Planning and management	How to plan and follow up on ESG tasks.	Making simple ESG action plans and checking progress.	Organized, practical.	Supporting SMEs to create basic ESG plans (e.g. reduce energy waste).
3.3 Coping with uncertainty and risk	ESG actions may involve unknowns or risks	Making careful choices when ESG outcomes are not clear.	Calm, flexible.	Helping SMEs act on ESG even when things feel uncertain.
3.4 Working with others	How to work well with others on ESG (internally or externally).	Collaborating to reach shared ESG goals.	Respectful, cooperative.	Supporting teamwork across roles or with partners for simple ESG actions.
3.5 Learning through experience	ESG is a learning process.	Improving ESG practices based on what worked or didn't.	Open to feedback and trying again.	Helping SMEs reflect and adapt ESG actions over time.

4.2

GreenComp (Green Competences)

GreenComp, the European Sustainability Competence Framework defines a shared set of competences to **guide education and lifelong learning for sustainability**.

Developed by the Joint Research Centre of the European Commission, **GreenComp is designed to help individuals actively live, work, and learn in ways that support environmental, social, and economic sustainability**

It promotes **systems thinking, futures literacy, and collective action** as core drivers of sustainability-oriented behaviour and **learning**. **GreenComp** is structured around **four interlinked competence areas**:

01

Embodying Sustainability Values



02

Embracing Complexity in Sustainability



03

Envisioning Sustainable Futures



04

Acting for Sustainability



Each area contains three competences, forming a total of twelve. These are not domain-specific but intended to be adapted across contexts, including vocational education and training (VET). Within PEARL, the GreenComp framework provides a guiding lens to ensure the curriculum builds the knowledge, values, and behaviours

needed to embed environmental and social sustainability in ESG thinking, business operations, and vocational practices. Our training supports VET learners and educators to apply these competences through practical activities, ESG literacy, and real-world application in the SME context.

Below, each competence is detailed with its **Knowledge (K)**, **Skills (S)**, **Attitudes (A)**, and **PEARL Context**, all adapted to an ESG-focused perspective.



Area 1: Embodying Sustainability Values

Competence	Knowledge (K)	Skills (S)	Attitudes (A)	PEARL Context
Valuing	ESG means doing business responsibly and ethically.	Choosing actions that match ESG values.	Honest, responsible.	Helping SMEs treat ESG as a basic business value, not just a trend.
Supporting fairness	What fair treatment, inclusion, and equity mean in business.	Treating people fairly and supporting inclusion.	Respectful, inclusive.	Encouraging fair and inclusive practices at work (e.g. equal pay, safe work).
Promoting nature	Why protecting nature and resources is important.	Making small nature-friendly choices (e.g. less waste, local sourcing).	Respect for the environment.	Helping SMEs take simple steps that support environmental care.



Area 2: Embracing Complexity in Sustainability

Competence	Knowledge (K)	Skills (S)	Attitudes (A)	PEARL Context
Systems thinking	ESG topics are all connected (e.g. Energy, people, community).	Seeing the full picture when looking at ESG.	Open to complexity.	Helping SMEs understand how different ESG issues affect each other.
Critical thinking	How to check if ESG info is true or useful.	Asking questions before making ESG decisions.	Curious, careful.	Supporting smart ESG decisions based on facts, not trends.
Problem framing	How to clearly describe an ESG issue in the business.	Defining ESG problems in simple terms.	Solution-oriented.	Helping SMEs identify which ESG challenges to tackle first.



Area 3: Envisioning Sustainable Futures

Competence	Knowledge (K)	Skills (S)	Attitudes (A)	PEARL Context
Futures literacy	ESG means thinking ahead	Setting long-term ESG goals.	Forward-looking.	Supporting SMEs to plan for sustainability, not just short-term profit.
Adaptability	ESG needs and rules change over time.	Changing ESG plans when needed.	Flexible, willing to adjust.	Helping SMEs respond to new ESG rules or customer demands.
Exploratory thinking	There are many ways to be more sustainable.	Trying new ideas to improve ESG.	Open to new ideas.	Encouraging SMEs to test simple and creative ESG solutions.



Area 4: Acting for Sustainability

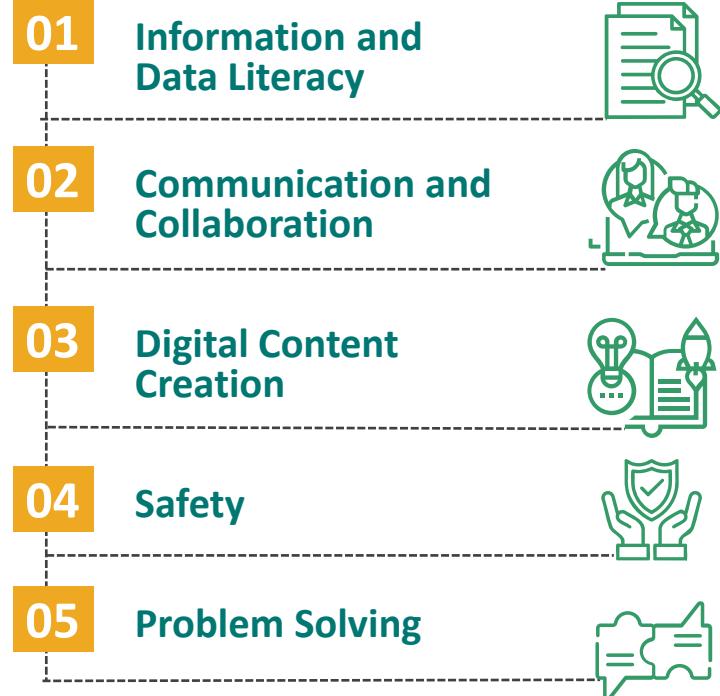
Competence	Knowledge (K)	Skills (S)	Attitudes (A)	PEARL Context
Political agency	ESG policies and regulations.	Understanding and following ESG-related rules.	Engaged, aware.	Supporting SMEs to keep up with relevant ESG policies and speak up when needed.
Collective action	Knowing ESG is a team effort.	Working together with others on ESG.	Cooperative, supportive.	Helping SMEs work with staff, suppliers or community for ESG goals.
Individual initiative	Knowing what you personally can do for ESG at work.	Taking small ESG actions yourself.	Responsible, proactive.	Empowering SME employees to lead or support ESG in their own roles.

4.3 Digcomp (Digital Competences)

The **DigComp Framework, or Digital Competence Framework for European Citizens**, defines the **basic digital competences** necessary for the **personal, social, and professional development of individuals**.

In the PEARL project, DigComp has been adapted to **strengthen the digital literacy capacity of VET professionals and SMEs**, thereby developing their ability to effectively collect, interpret, and communicate ESG data.

DigiComp is structured around **five areas**:



DigComp ensures that ESG processes are supported by robust digital competencies. This helps SMEs manage ESG risks, engage transparently with stakeholders, and adapt to evolving regulatory requirements in an increasingly digital business world. While

DigComp includes a wider set of competences, within PEARL only the components most relevant to ESG implementation for SMEs have been selected and adapted.

Below, each competence is detailed with its **Knowledge (K)**, **Skills (S)**, **Attitudes (A)**, and **PEARL Context**, all adapted to an ESG-focused perspective.



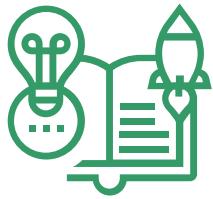
Area 1: Information and Data Literacy

Competence	Knowledge (K)	Skills (S)	Attitudes (A)	PEARL Context
Evaluating data, information, and digital content	Which ESG data is useful and where to find it.	Checking if ESG data is reliable and makes sense.	Careful, responsible.	Helping SMEs use trustworthy data for ESG planning and reporting.
Managing data, information, and digital content	Simple rules for storing and handling ESG info.	Keeping ESG files and documents organized.	Neat, accountable.	Supporting SMEs in managing ESG records for tracking progress.



Area 2: Communication and Collaboration

Competence	Knowledge (K)	Skills (S)	Attitudes (A)	PEARL Context
Collaborating through digital technologies	Tools for working together on ESG tasks.	Working online with others on ESG documents or checklists.	Team-oriented, respectful.	Encouraging digital teamwork for small ESG projects.



Area 3: Digital content creation

Competence	Knowledge (K)	Skills (S)	Attitudes (A)	PEARL Context
Developing digital content	Create ESG presentations and reports	design and prepare simple ESG-related materials	Creativity, clarity	Strengthens ESG communication and stakeholder engagement.



Area 4: Safety

Competence	Knowledge (K)	Skills (S)	Attitudes (A)	PEARL Context
Protecting personal data & privacy	Data protection laws and privacy principles in ESG reporting.	Implement data security practices in ESG processes	Ethical awareness, responsibility.	Highlights the importance of data privacy and ethical digital practices.



Area 5: Problem Solving

Competence	Knowledge (K)	Skills (S)	Attitudes (A)	PEARL Context
Creatively using digital technologies	innovative ways to use digital tools for ESG solutions.	Creatively apply digital tools to improve ESG practices	Proactiveness, openness to change, innovation mindset.	Promotes innovative approaches to ESG problem solving and adaptation.

05

Conclusion



The **PEARL Knowledge Framework** is a **foundational and practice-driven** resource that translates complex ESG concepts into **accessible learning** for SMEs and VET providers.

It stands out by aligning
three major EU
competence models:

A targeted ESG curriculum
designed specifically for micro
and small enterprises.

Developed within insights
from SME managers, VET
educators and ESG experts,
the framework is shaped by
real-world needs.

01

EntreComp



02

GreenComp



03

DigComp





“Built on insights gathered through country reports and semi-structured interviews, the framework provides the evidence base for defining the core learning priorities and module topics of the PEARL curriculum. The framework is directly operationalised through the competence matrix (Knowledge, Skills, Attitudes), which ensures that the curriculum is pedagogically grounded and fully tailored to the needs identified across partner countries and wider stakeholders.”

This approach defines what professionals need to know (**knowledge**), how they should apply it (**skills**), and the mindset they should adopt (**attitudes**) to effectively embed ESG principles into business practices.

It provides a **multidimensional foundation** that not only supports regulatory compliance but also **empowers SMEs to drive resilience, innovation, and long-term value creation**.

To address the **time, resource, and knowledge constraints** common among SMEs, the framework emphasises **clarity, simplicity, and practical relevance**. Each competence area has been refined to promote step-by-step ESG learning, enabling even the smallest enterprises to **build awareness, assess risk, and take meaningful action**.

As the next step, the knowledge framework will be translated into a modular curriculum, with topics derived directly from research insights, and complemented by practical tools and resources designed to guide implementation, enhance learning, and promote continuous

improvement. Together, these elements will enable SMEs and VET educators to transform ESG awareness into concrete actions, embed ESG values at all organizational levels, and build a sustainable, future-proof business ecosystem fully aligned with EU priorities.

06

Resources

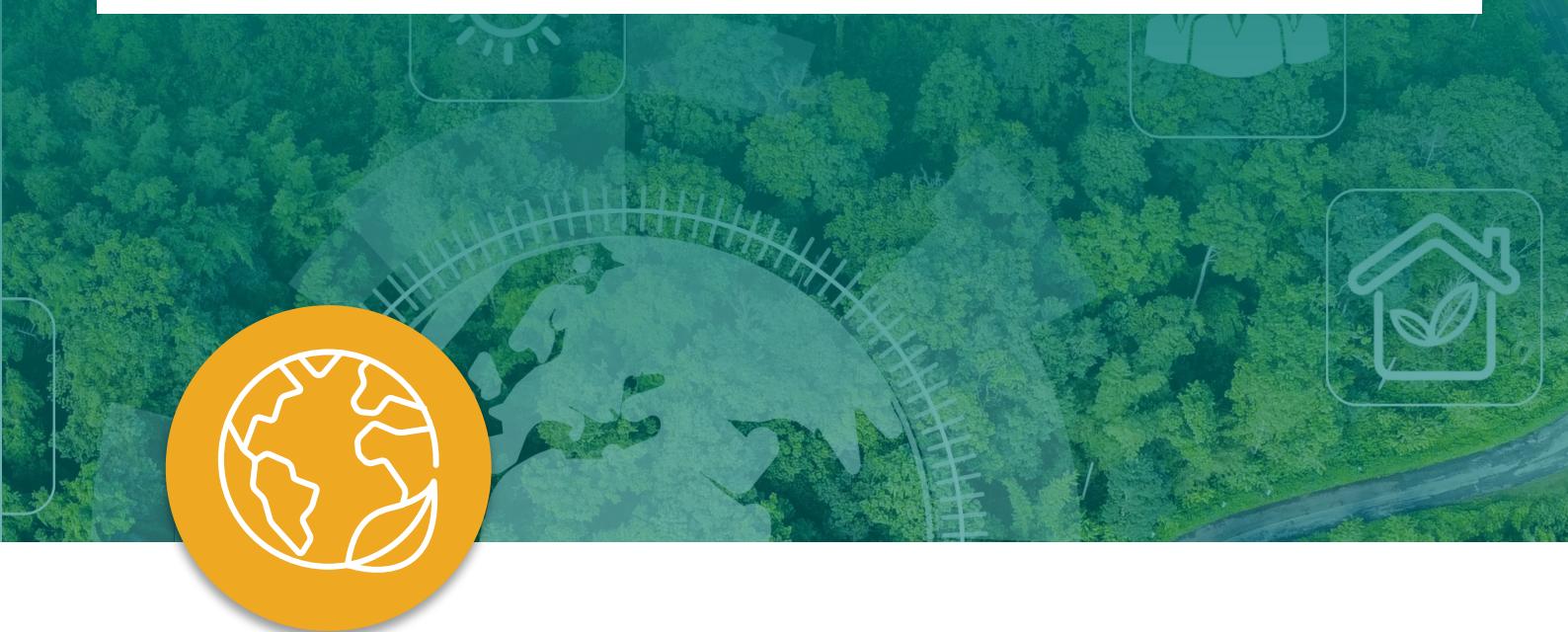
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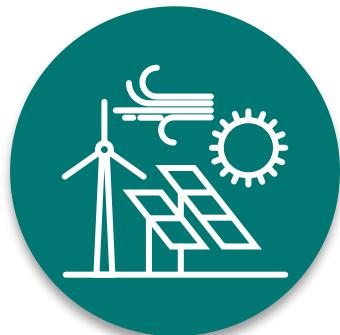
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