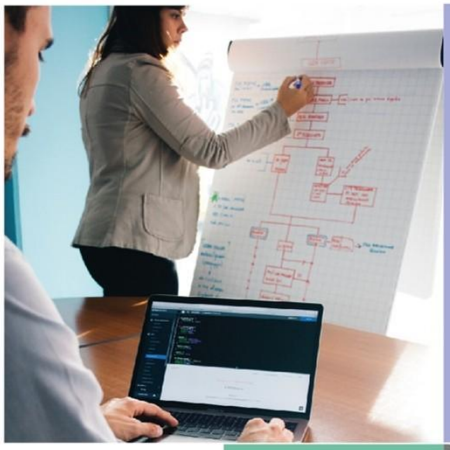
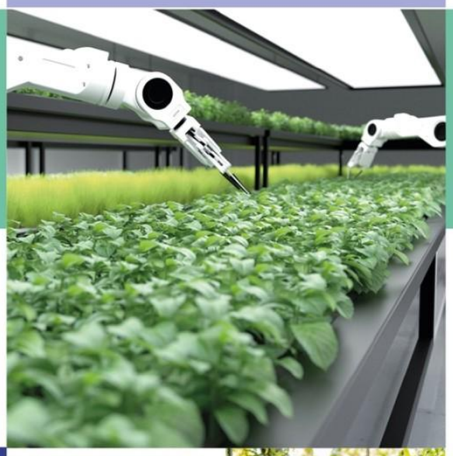
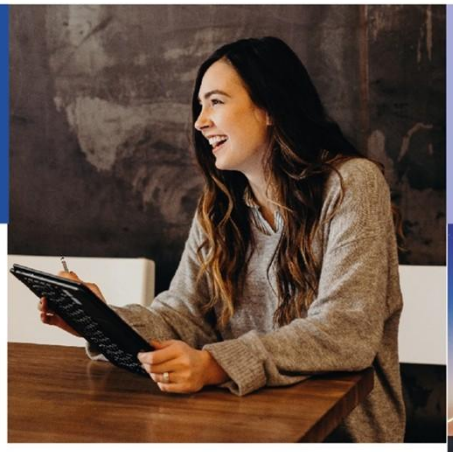
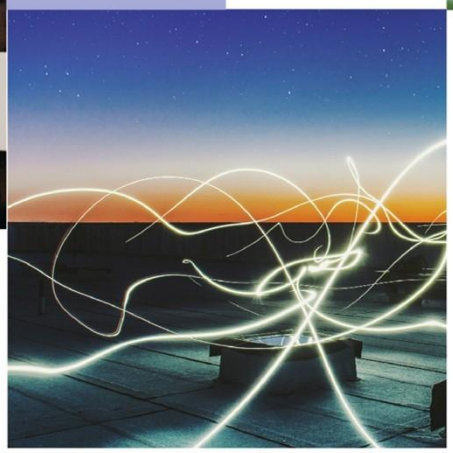
Co-funded by
the European Union



Entrecomp
for transition







EntreComp4Transition Policy Recommendations

THE SUSTAINABLE WAY TO THE TWIN TRANSITION

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

Project Name	**Building upon the EntreComp Framework for a Green and Digital Transition**
Project Acronym	EntreComp4Transition
Work Package	7
Document Title	EntreComp4Transition Policy Recommendations
Type	R
Dissemination	PUB
Date Revision	30 April 2025
Led by	EUROCHAMBRES

Disclaimer

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

April 2025

Contents

INTRODUCTION 5

ABOUT ENTRECOMP4TRANSITION 6

CHALLENGES IN RELATION TO ENTREPRENEURIAL, DIGITAL AND GREEN SKILLS GAP 7

ENTRECOMP4TRANSITION TRANSFERABLE TOOLS AND METHODOLOGY 13

POTENTIAL CONTRIBUTION TO SMART SPECIALISATION STRATEGIES 14

PROJECT RECOMMENDATION – AN INVITATION TO ADOPT, INTEGRATE, AND ADVANCE THE TWIN TRANSITION JOURNEY 19

Co-funded by the European Union

EntreComp for transition

EntreComp4Transition Policy Recommendations

THE SUSTAINABLE WAY TO THE TWIN TRANSITION

INTRODUCTION

Small and medium-sized enterprises (SMEs) represent a fundamental part of the economic and social fabric, representing 99% of all businesses and employing two-thirds of the workforce. However, in an ever-changing global environment, they face significant challenges in maintaining their competitiveness and ensuring their survival.

The transition of companies towards a digitalisation of their processes and the assumption of a sustainable business model is not a passing fad, but an imperative necessity for businesses seeking to thrive in the current context. Implementing innovative measures adapted to the diversity of these companies is key to favouring their development, innovation and survival, thus contributing to the economic and social progress of their environment. EntreComp4Transition (EC4T) has developed innovative learning pathways to develop entrepreneurial, green and digital skills for VET and SMEs, facilitating smart economic transformation and responding directly to ERDF policy priorities for a smarter and greener Europe[1]. Within the testing, the use of open badges and MOOC-based upskilling pathways have proven effective, supporting aligns with the European Skills Agenda and the Europass Digital Credentials Framework, making learning outcomes portable and verifiable across borders.

The World Economic Forum's annual report, Future of Jobs Report 2025, states that by 2030, almost 80% of companies will be looking to train their staff in digital skills and 68% will be looking for talent specialised in the development of technology such as AI, as well as offering improved job opportunities to staff trained in these sought-after skills. These forecasts reinforce the Digital Decade's focus on AI literacy and advanced digital competencies and the priorities of the EU Digital Europe programme. Contributing to this, EC4T has successfully piloted an AI-driven skill-gap tool that can be replicated across other S3 regions to inform evidence-based ERDF and ESF+ investments.

With regards to the green transition, although lagging behind the digital transition in terms of interest expressed by employers, it is gaining ground and the need to move in this direction is being recognised. More than fifty thousand European companies are already considering the requirements of the Corporate Sustainability Reporting Directive (CSRD)[2], a key instrument of the European Green Deal, so it is essential to embrace this digital transformation and be prepared for the future.

This document provides policy recommendations developed within the EntreComp4Transition project, which focuses on facilitating the green and digital transitions crucial for small and medium-sized enterprises (SMEs) in Europe. It highlights the significant skills gaps in entrepreneurial, digital, and sustainability areas currently

[1] https://ec.europa.eu/regional_policy/policy/how/priorities_en

[2] For more information on the European Commission Omnibus packages (published February 2025) amending the Corporate Sustainability Reporting Directive see https://finance.ec.europa.eu/publications/commission-simplifies-rules-sustainability-and-eu-investments-delivering-over-eu6-billion_en

challenging SMEs and presents innovative methodologies, tools, and learning pathways designed to address these gaps.

This comes at a critical time for this work in Europe, following the recent launch of the Union of Skills initiative[3] and the ongoing work to implement the Green Deal and achieve the targets for the Digital Decade. The intention of this paper is to offer practical guidance to policymakers, educational institutions, and business associations, supporting the integration and implementation of the EC4T project's outcomes, inviting them to adopt, adapt and scale the EntreComp4Transition tools. The insights and tools within this guidance show how EC4T delivers micro-credentials, AI-based skills intelligence and Smart Specialisation–ready learning pathways, offering the potential for others to use these insights and tools to foster competitiveness, innovation, and sustainable growth in countries and regions across Europe.

ABOUT ENTRECOMP4TRANSITION

The **EntreComp4Transition** project aimed to develop new, innovative, multidisciplinary approaches to teaching and learning, paving the way for the future “Green Transition Facilitator”. The project, co-funded by the European Union, is an alliance between SMEs (represented by the Chambers of Commerce), Higher Education (HE) and Vocational Education and Training (VET) Institutions in 5 country clusters: Austria, Belgium, Italy, Spain, and Türkiye.

Activities included an in-depth analysis of skills gaps, the development of a dual blended methodology with innovative learning content delivered via a Massive Open Online Course (MOOC), frameworks, pilot sessions, a mobility scheme, and the creation of open badges as a model of micro-credentialing, in full alignment with the 2022 Council Recommendation on Micro-Credentials and the Europass Digital Credentials standard, to support HEIs and VET providers and enable businesses to verify acquired competences.

EntreComp4Transition responds directly to the following policy priorities at European level:

- Union of Skills
- European Skills Agenda
- Digital Europe Programme
- ERDF 2021–2027 “A Smarter Europe through Innovation” - policy objectives 1 and 2
- Europass Digital Credentials Framework

[3] https://commission.europa.eu/topics/eu-competitiveness/union-skills_en

EntreComp4Transition is led by Eurochambres, the Association of European Chambers of Commerce and Industry, which represents the interests of 1,700 regional and local chambers of commerce and their 20-million-member companies from all economic sectors across Europe. Partners from Belgium, Spain, Türkiye, Italy and Austria are working together to develop new, innovative, multidisciplinary approaches to teaching and learning, paving the way towards a digital and green future.

Figure 1The EntreComp4Transition partnership

CHALLENGES RELATED TO ENTREPRENEURIAL, DIGITAL AND GREEN SKILLS GAP

An in-depth analysis of skills gaps in entrepreneurial, digital, and sustainability domains was conducted to identify the competences needed by students and professionals to support the green and digital transition, and therefore, establish the learning outcomes for a new learning experience.

Grounded in the European Commission's competence frameworks – GreenComp[4], EntreComp[5] and DigComp[6] -, the overall objective of this research has been to identify **skills mismatches** between education and training, on the one hand, and on the other, the labour market regarding digital and green soft skills required by the future "**green transition facilitator**".

The project's skills gap analysis reveals a significant mismatch between current education and labour market demands, especially in sectors crucial for achieving the EU's climate neutrality goals and digital competitiveness targets. For instance, preliminary data shows that 40% of SMEs surveyed lack structured pathways for digital upskilling, and more than half report difficulties in attracting sustainability-oriented talent. These findings underscore the urgency for aligned regional policy interventions.

The main findings were:

Digitalisation Challenges:

1. **Cost of Investments**: SMEs often encounter substantial financial burdens due to the high initial and ongoing costs associated with digitalisation investments.
2. **Lack of Time and Knowledge**: SMEs frequently struggle with insufficient time and limited expertise necessary to effectively engage in digitalisation processes and fully grasp their potential impacts.
3. **Digital Security and Privacy**: SMEs are hindered by serious concerns about digital security and privacy, which can prevent them from fully embracing digital technologies.
4. **Infrastructure and Bureaucracy**: Digitalisation efforts are often impeded by inadequate infrastructure and overly complex bureaucratic processes, particularly within public-private collaboration frameworks.

[4] GreenComp – GreenComp is a reference framework for sustainability competencies, released by the European Commission in 2022 [for more information, visit: JRC Publications Repository - GreenComp The European sustainability competence framework (europa.eu)].
[5] EntreComp – The European Entrepreneurship Competence Framework is a reference framework developed by the European Commission to explain what is meant by an entrepreneurial mindset [for more info, visit The European Entrepreneurship Competence Framework (EntreComp) - Employment, Social Affairs & Inclusion - European Commission (europa.eu)].
[6] DigComp – The Digital Competence Framework for Citizen (DigComp) provides a common understanding of what digital competence is [for more information, go to: DigComp 2.2: The Digital Competence Framework for Citizens - With new examples of knowledge, skills and attitudes (europa.eu)].

Sustainability Challenges:

1. **Uncertainty about Returns**: SMEs face difficulties assessing the profitability and financial returns associated with adopting sustainability practices, creating hesitation and reluctance to invest.
2. **Lack of Specialised Human Resources**: A shortage of professionals with specialised sustainability skills presents a significant barrier for SMEs aiming to implement sustainability initiatives effectively.
3. **Economic and Financial Barriers**: Broader economic instability and challenges in securing funding pose substantial obstacles for SMEs seeking to pursue sustainability strategies.
4. **Regulatory Compliance**: SMEs frequently find it challenging to navigate and comply with evolving legal requirements related to sustainability, adding complexity to their operational processes.

Entrepreneurial Skills Gaps:

1. **Mismatch with Market Needs**: Formal educational systems often fail to adequately align with the practical skills and entrepreneurial competences required by SMEs, resulting in significant skill mismatches.
2. **Lack of Training for Trainers**: Higher education institutions provide insufficient training to educators on emerging technologies and essential entrepreneurial skills, reducing their effectiveness in equipping students for the current market.
3. **Need for Lifelong Learning**: To address the fast-paced changes in the market, continuous training and lifelong learning become crucial for SMEs and their workforce to remain competitive and adaptive.

Specific Competences Required:

To thrive in the twin transition, SMEs need:

1. **Advanced Digital Competences**, including expertise in artificial intelligence, machine learning, cybersecurity, data science, and digital content creation.
2. **Sustainability Competences**, including expertise in renewable energy technologies, circular economy principles, energy auditing, and managing transitions to sustainable practices.
3. **Entrepreneurial Competences**, including identifying opportunities, sustaining motivation and perseverance, strategic planning and management, and effectively handling uncertainty, essential to nurturing an entrepreneurial mindset.

The project's self-assessment tool, completed by **506** participants worldwide—with a focus on Austria, Belgium, Italy, Spain, and Turkey (411 replies)—provided key insights

through 23 targeted questions. The results reveal clear differences in digital and sustainability maturity across organisations and countries[7].

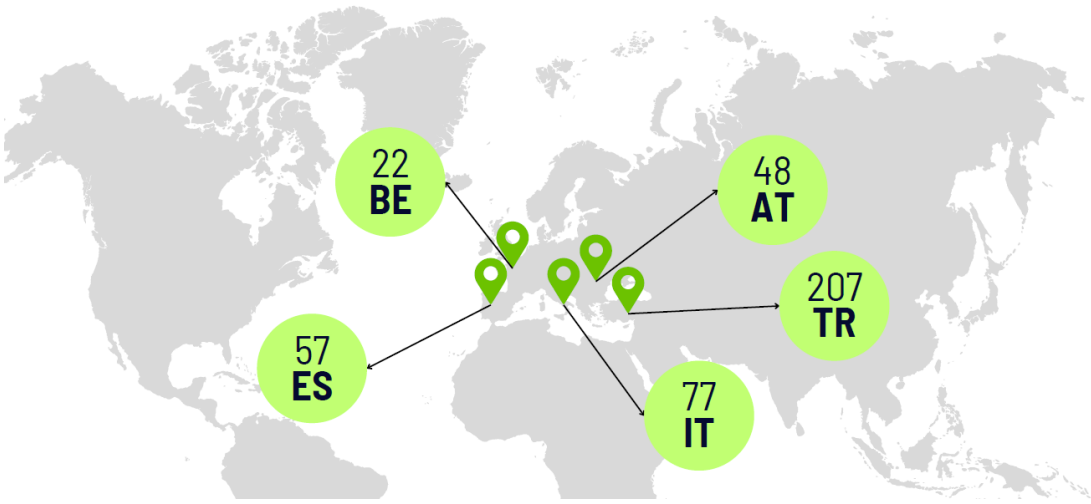


Figure 2 Completed Forms per Country of the project

The insights show the ongoing challenges and differences that organisations face on their path to becoming more digitally advanced and sustainable.

SMEs face significant barriers in both digital transformation and sustainability. Limited financial, human, and technological resources restrict their ability to invest in digital tools or specialised staff. A notable digital skills gap further hampers progress, with many employees lacking advanced competencies. SMEs are also more exposed to cybersecurity risks, which can have serious operational and financial consequences. While some have adopted remote work tools, others still rely on traditional methods, limiting adaptability and resilience.

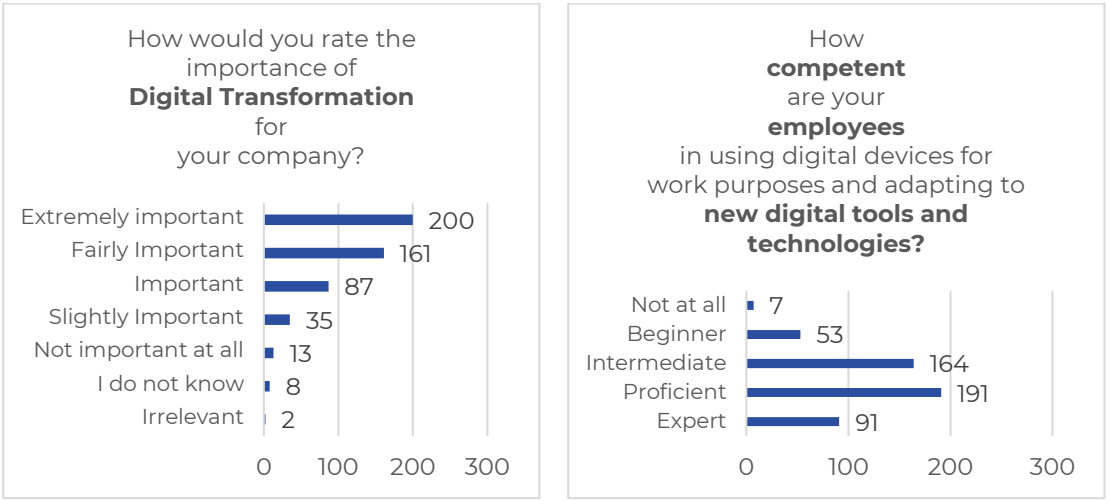


Figure 3 - Answers from Self-Assessment Tool (March 2025)

[7] The tool was developed by Poltio.app, with data analysis support provided by Aytac Uzunlas, responsible for both the formulation of survey questions grounded in the DigComp and GreenComp frameworks and the subsequent data analysis.

Data gathered from the self-assessment reveal that while digital transformation is widely recognised as important—200 out of 506 respondents rated it "Extremely important"—perceptions vary by country, with Austria showing notably higher prioritisation than Spain.

Larger companies (101–250 employees) are more likely to prioritise digital transformation, due to greater resources and operational complexity. Nonetheless, a digital skills gap remains prevalent, with many employees at beginner or intermediate levels, particularly outside the IT sector. In fact, answers change drastically, according to the sector: for instance, the manufacturing and logistics sectors report notably lower digital competence.

While awareness of GDPR and data privacy is widespread (familiarity with data privacy regulations was high, with 76% being aware), implementation of robust protection measures is inconsistent, exposing gaps between regulation and practice.

In sustainability, although its importance is broadly acknowledged, actual implementation remains fragmented. Most organisations are still in early or informal stages, with limited integration into supply chains or alignment with company values. Training efforts are irregular, and climate-related risk assessments are often basic.

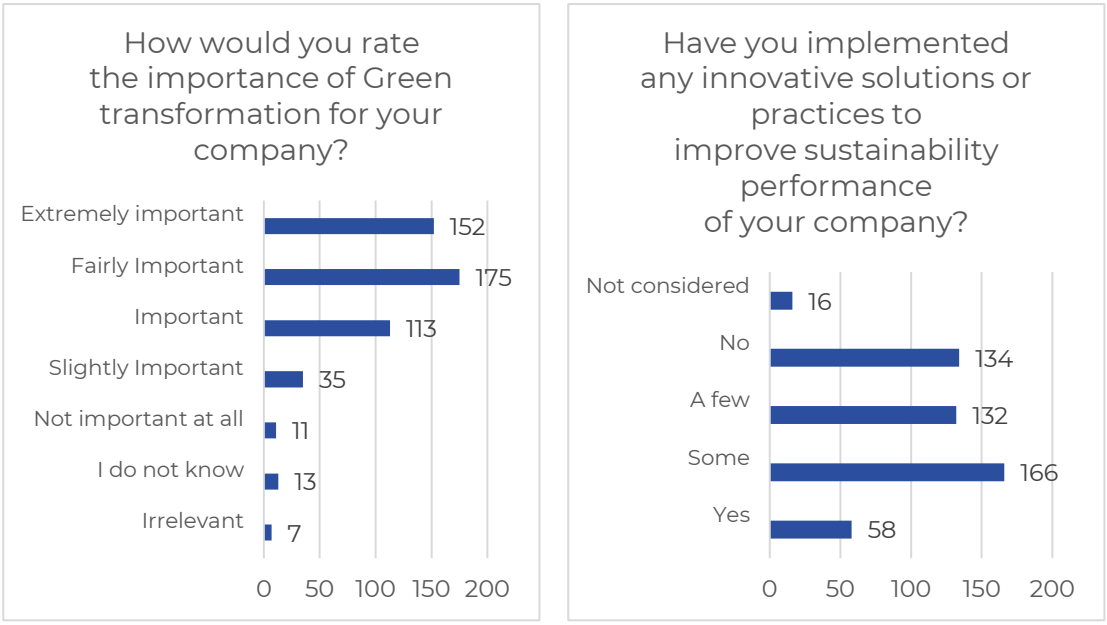


Figure 4 - Answers from Self-Assessment Tool (March 2025)

Resource constraints again pose challenges, as sustainable practices often require upfront investment. Many SMEs struggle with integrating sustainability into operations and typically operate with informal or developing governance structures. Moreover, limited capacity for measuring and reporting sustainability performance can hinder access to green financing and reduce visibility of their efforts to key stakeholders.

Integration of sustainability into core operations, like supply chains, is limited, and alignment with company values is not always clear.

Training on sustainability is sporadic, with many companies offering it only occasionally or not at all.

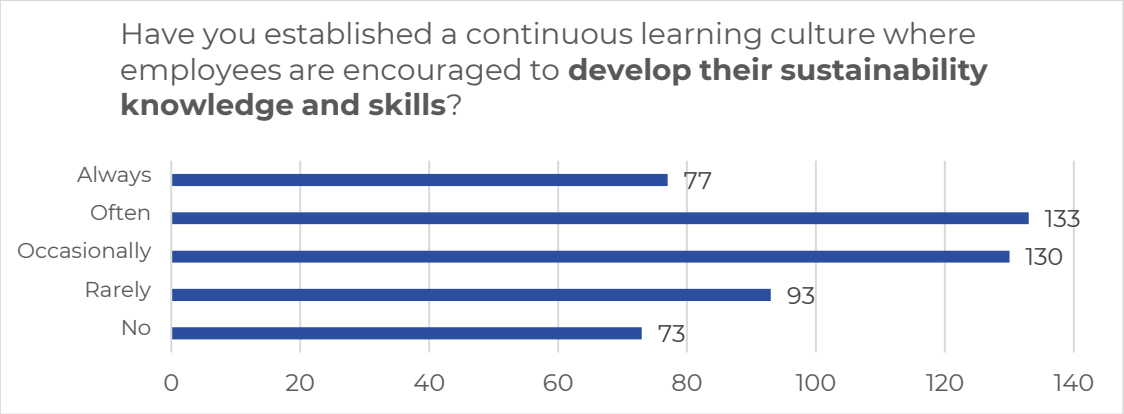


Figure 5 – Answers from self-assessment tool (March 2025)

Resource management strategies are often basic, and climate-related risk identification is still in its early stages.

Country-Specific Insights:

Austria and Belgium lead in digital and green transformation, with high digital competence, advanced use of remote tools, and a stronger alignment between sustainability and business strategy. Austria stands out with 66.7% of respondents rating digital transformation as "Extremely important" and high levels of digital expertise. Spain and Turkey show lower digital competence, especially in data analysis and content creation, and lag in cybersecurity preparedness. Italy maintains a balanced position, showing moderate digital maturity and commitment to sustainability.

Role and Value of the Self-Assessment Tool:

The tool has proved highly valuable for:

1. **Identifying Competence Gaps:** It supports SMEs in diagnosing their current capabilities and targeting skills development.
2. **Guiding Digital and Green Adoption:** The tool informs tailored support and enables tracking of digital and sustainability progress over time.
3. **Fostering Peer Learning and Collaboration:** By highlighting best-performing SMEs and aligning complementary needs, it encourages knowledge exchange and benchmarking.

Ultimately, the insights from this tool offer concrete direction for closing the skills gap and accelerating the transition to a more sustainable and digitally empowered SME landscape.

ENTRECOMP4TRANSITION TRANSFERABLE TOOLS AND METHODOLOGY

Self-Diagnosis Tool

As explained in the above section, to identify the baseline situation of the company and subsequently select the necessary training and actions to facilitate the green and digital transition, EntreComp4Transition has developed a **self-diagnosis tool**. This tool is based on the European reference frameworks and allows the company to autonomously assess the aspects that need to be improved to promote this twin transition and become a competitive company adapted to the needs of a modern and sustainable society.

The tool has the potential to serve as a core mechanism for Smart Specialisation governance, allowing regional authorities to map skill gaps and inform the allocation of ERDF and ESF+ resources for green and digital upskilling. It is ECVET/EQAVET compliant and can issue Europass Digital Credentials, facilitating regions to integrate it into S3 governance dashboards.

Learning Paths and Methodology to train the future Green Transition Facilitator

After comprehensive research, key competences were identified for training a Green Transition Facilitator, whose role is to support SMEs in their journey towards digitalisation and sustainable transformation, strengthening their resilience and ensuring their long-term survival.

Acknowledging the diversity among SMEs in terms of industry sectors, size, and current stages of transition, the training programme has been designed to be both cross-cutting and adaptable, catering effectively to a broad spectrum of circumstances and organisational needs.

The EntreComp4Transition (EC4T) learning methodology directly addresses many of the structural challenges faced by SMEs in navigating the twin transition. By equipping learners with entrepreneurial, digital, and sustainability competences, EC4T helps close the skills gap and empowers SMEs to innovate, remain competitive, and grow sustainably.

Utilising a dynamic and flexible methodology, the training content is contemporary and specifically addresses the real demands identified by social stakeholders actively engaged in regional development. These include businesses, VET and higher education institutions from the five countries forming the innovation partnership.

The Learning Paths, developed and tested by the project alliance, offer an innovative and accessible resource for diverse stakeholder groups. They enable SMEs lacking specialised departments or the capacity to employ full-time experts to effectively qualify, upskill, or reskill their workforce. Providing employees with relevant knowledge and transferable skills to manage the twin transition is essential to maintaining their competitiveness and adaptability.

The Learning Paths can be carried out in different ways:

- ✓ **Individually and autonomously**: Any learner, being a student, employee or SME leader can access the learning content at their own pace and according to personal needs. At the end of each of the first three learning paths, upon successful completion, the learner receives a digital badge recognising them as a sustainability, digital transformation, and/or entrepreneurship practitioner. The fourth learning path offers the learner recognition of using the tools and strategies to be the Green Transition Facilitator, and by successfully completing all learning paths the EC4T Twin Transition Champion badge is granted.
- ✓ **Trainer-led**: A trainer guides the learning journey, adapting the most relevant experiences from the provided learning paths and leveraging additional resources specifically designed to enhance meaningful face-to-face training sessions.

POTENTIAL CONTRIBUTION TO SMART SPECIALISATION STRATEGIES

HUMAN CAPITAL DEVELOPMENT

The Smart Specialisation Strategy (S3) in Europe is an innovation-focused approach aimed at fostering regional development by leveraging specific competitive advantages. In the context of the dual digital and green transitions, S3 plays a crucial role in transforming SMEs by promoting sustainability initiatives and the adoption of emerging technologies.

Key Areas of S3 Related to Digital and Green Transitions

Digitalisation and Emerging Technologies:

- Industry 4.0: Automation, Artificial Intelligence (AI), and robotics to enhance production efficiency and reduce waste.
- Digital Transformation of SMEs: Encouraging adoption of digital tools such as e-commerce, cybersecurity, and big data analytics.
- Connectivity and 5G: Improving digital infrastructure to boost competitiveness in both rural and urban settings.

- Artificial Intelligence and Blockchain: Using smart solutions for process optimisation, traceability, and sustainability.

Green Transition and Circular Economy:

- Energy Efficiency and Renewable Energy: Adopting sustainable practices in energy production and consumption.
- Sustainable Mobility: Supporting electrification of transport and green logistics.
- Clean Production and Circular Economy: Minimising waste and optimising resource utilisation.
- Bioeconomy and Sustainable Materials: Promoting environmentally friendly materials and technologies.

Innovation and Green & Digital Entrepreneurship:

- Innovation Ecosystems: Facilitating cooperation between businesses, research centres, and public administrations.
- Training in Digital and Green Skills: Developing key competences essential for SME transformations.
- Funding and Support for R&D: Leveraging incentives and European programmes to adopt green and digital innovations.

Effective collaboration between public and private sectors remains critical for a successful transition.

S3 and EntreComp4Transition

The EntreComp4Transition project aims to equip SMEs across Europe with the entrepreneurial skills and competences necessary to navigate the dual digital and green transitions effectively. By aligning its efforts closely with the Smart Specialisation Strategies (S3), EC4T contributes substantially to regional innovation ecosystems, addressing country-specific priorities identified through participatory processes. In doing so, the project not only fosters innovative mindsets and practical skills but also enhances the capacity of local economies to leverage their unique competitive advantages for sustainable growth and digital transformation.

The following sections detail the specific contributions of EC4T to the S3 frameworks in Austria, Belgium (Wallonia), Italy, Spain (Extremadura), and Türkiye. Each country's strategic priorities and regional specialisations are carefully considered to demonstrate how EC4T's approach meaningfully advances digitalisation, sustainability, innovation ecosystems, and human capital development.

EntreComp4Transition contributes to the EU Smart Specialisation Platform's objectives by providing data-driven insights, transferable methodologies, and a validated training ecosystem. The project acts as a policy enabler, supporting regions in designing evidence-based upskilling strategies aligned with their S3 priorities. Using AI-based self-

assessment tools and open educational resources, EC4T offers an actionable blueprint for regions navigating the twin transitions.

To operationalise these insights, regional authorities can embed the AI self-diagnosis dashboard into S3 monitoring systems, earmarking ERDF priority 1 or 2 funds for programmes that up-skill at least 1 000 SME employees per region by 2027.

Austria

Regional Overview:

Austria's Smart Specialisation Strategy employs a decentralised approach, allowing regions such as Vienna to prioritise local strengths in sustainability and innovation. Vienna particularly stands out as an innovation hub, strategically capitalising on a knowledge-based economy with clear objectives:

- Sustainable Innovation and Green Transition: Green technologies, renewable energy, energy-efficient solutions, and circular economy models.
- Digitalisation and Industry 4.0: Adoption of digital technologies (AI, automation, big data) especially by SMEs in manufacturing.
- Entrepreneurship and Workforce Development: Upskilling and reskilling initiatives focused on green and digital skills.
- Smart Public Administration and Governance: Digital governance solutions, smart mobility, and sustainable urban planning.

Role of EC4T in S3 implementation:

- Enhances entrepreneurial skills, specifically in SMEs, supporting sustainable and digital entrepreneurship.
- Provides training aimed at digital and green skills, notably in circular economy practices.
- Promotes regional innovation ecosystems through collaboration among SMEs, research centres, and start-ups.
- Strengthens public-private partnerships, aligning with Vienna's strategic innovation priorities.
- Offers mentorship and resources, supporting SMEs in adopting advanced sustainable and digital technologies.

Belgium (Wallonia)

Regional Overview:

Wallonia's S3 (2021–2027) framework targets regional innovation and industrial policy, structured around five Strategic Innovation Areas (SIAs):

- Circular Materials: Advancing sustainability and circular economy principles.

- Enhanced Health Innovations: Healthcare technology and life sciences developments.
- Agile and Safe Design and Production Methods: Emphasis on Industry 4.0, AI, IoT, cybersecurity, and digital twins.
- Sustainable Energy Systems and Housing: Energy efficiency, renewable energy, and sustainable building practices.
- Agri-Food and Environmental Management: Innovations in sustainable agriculture and environmental management.

Wallonia emphasises stakeholder involvement via the Entrepreneurial Discovery Process (EDP), integrating digital technologies extensively.

Role of EC4T in S3 implementation:

- Cultivates entrepreneurial mindsets aligned with Wallonia's strategic innovation sectors.
- Introduces and supports the 'Green Transition Facilitator' role, assisting SMEs with sustainable and digital business adaptations.
- Develops targeted learning pathways (Sustainability Practitioner, Digital Transformation Practitioner) to bridge skills gaps.
- Promotes inclusive stakeholder collaboration, reflecting Wallonia's EDP approach.
- Provides recognised certifications (ECTS/ECVET points, open badges), enhancing regional workforce competitiveness.
- Uses blended methodologies (digital and face-to-face learning) for flexible SME training solutions.

Italy

Regional Overview:

Part of Italy's regional S3 strategies (2021–2027) focus on sustainable and digital practices in Tourism, enhancing natural and cultural heritage across regions. Regional policies aim to make tourism a driver of economic development:

- North (Veneto, Lombardy): Digital and experiential tourism, augmented reality, food, wine, nature and wellness tourism, sustainable itineraries.
- Centre (Lazio, Tuscany): Digitalisation of cultural heritage, sustainable and responsible tourism, strategising off-season traveling for economic growth.
- South (Calabria, Abruzzo, Campania): Ecotourism, rural tourism, mountain tourism infrastructure, and effective digital management of tourist flows.
- Islands (Sicily): Digitalisation for cultural accessibility and enjoyment of heritage.

Role of EC4T in S3 implementation:

- Establishes the Green Transition Facilitator role to assist SMEs in adopting advanced digital solutions for tourism.
- Supports the efficient and sustainable management of tourist flows via specialised training.
- Promotes integration of sustainable practices within regional tourism strategies.
- Strengthens regional SMEs' competitiveness, resilience, and sustainability, extending easily across other sectors.

Spain (Extremadura)

Regional Overview:

Spain's S3 (2021–2027) identifies priorities including cybersecurity, digital world and industry including AI and robotics, new manufacturing techniques and solutions, climate change and decarbonisation, smart agriculture, sustainable cities, and mobility. Specifically, Extremadura's S3 emphasises:

- Agri-food sector: Enhancing competitiveness through high-quality regional products.
- Renewable Energies: Utilising climatic conditions for leadership in solar energy production.
- Sustainable Tourism: Capitalising on cultural and natural heritage for diversified, high-quality tourism.

Role of EC4T in S3 implementation:

- Aligns learning pathways with RIS3 Extremadura, aiding SMEs' digital and sustainable transformations.
- Encourages sustainable business practices, systems thinking, and responsible resource utilisation.
- Equips entrepreneurs and employees with skills crucial for digitalisation and sustainability transitions.
- Supports regional competitiveness by facilitating the dual transition (green and digital) effectively.

Türkiye

Regional Overview:

Türkiye integrates smart specialisation strategies at national and regional (NUTS II) levels, coordinated by Development Agencies (DAs) and local Chambers of Commerce and Industry. The recent initiative CEDIS3 (2023) strengthens regional capacity for

developing and implementing S3, developing specialised training, a handbook, S3 roadmap creation, and pilot projects.

Role of EC4T in S3 implementation:

- Provides specialised training pathways employed by vocational education (VET) institutions, universities, and continuous education centres.
- Enhances SME capacity building and skill development relevant to regional sectoral priorities.
- Encourages innovation through targeted upskilling and reskilling efforts, stimulating regional economic and innovation growth.

Overall, the EntreComp4Transition project's targeted contributions clearly align with, and actively reinforce, the objectives of regional Smart Specialisation Strategies across Europe. By fostering entrepreneurial mindsets, advancing digital and green skills, and facilitating strategic public-private collaboration, EC4T effectively supports SMEs in their journeys toward sustainable innovation and digital transformation. Ultimately, these collaborative efforts not only enhance the competitiveness and resilience of regional economies but also provide a replicable model for sustainable and inclusive economic growth throughout Europe.

PROJECT RECOMMENDATION – AN INVITATION TO ADOPT, INTEGRATE, AND ADVANCE THE TWIN TRANSITION JOURNEY

How can we effectively equip current and future professionals with the entrepreneurial, digital, and sustainability competences necessary to drive and accelerate the Twin Transition, empowering SMEs and organisations to innovate, remain competitive, and achieve sustainable growth?

The following recommendations consolidate our findings and provide a roadmap to bridge the gap between current challenges and the increasing demand for a twin transition within SMEs and organisations more broadly. The aim is for these recommendations to inspire decision-makers at national level to unlock training potential, thereby developing the essential skills needed to design a Twin Transition Strategy and implement meaningful changes towards genuinely entrepreneurial, digital, and sustainable practices and activities.

The innovative and dynamic approach is specifically designed to nurture critical digital, entrepreneurial, and sustainability competences within diverse educational contexts, providing practical tools for strategic development. These engaging learning journeys empower participants to become proactive Green Transition Facilitators, ideally positioned to guide SMEs and organisations in successfully adapting and implementing the Twin Transition Strategy proposed by EC4T.

At the European policy level, we recommend the integration of EntreComp4Transition's outputs into the Smart Specialisation Platform as a case study of effective upskilling and entrepreneurial support. Furthermore, a pilot initiative under the Recovery and Resilience Facility (RRF) could explore the scalability of the self-assessment tool in transition regions, helping SMEs identify workforce gaps and align with EU green/digital targets.

To optimise the impact of the EC4T learning methodology within both formal and non-formal education settings, the following recommendations are proposed:

Formal Training

In Vocational Training:

- Integrate transversal subjects such as employment orientation into existing curricula.
- Introduce dedicated modules on green and digital entrepreneurship tailored to various training cycles.
- Embed real-business challenges into learning through project-based assignments and applied placements in SMEs engaged in green and digital innovation.
- Offer self-paced EntreComp4Transition Learning Paths hosted on educational institutions' web platforms for extracurricular enrichment.
- Develop dual-learning pathways in partnership with local SMEs that focus on implementing the EC4T Twin Transition Strategy during apprenticeships or internships.

At University:

- Offer optional courses on sustainability, digitalisation and entrepreneurship accessible to all degree programmes.
- Develop short upskilling courses targeting broader community engagement.
- Host EC4T's MOOC on university resource websites for self-directed student learning.
- Provide capstone projects and research opportunities aligned with real-world Twin Transition challenges.

- Host student competitions and hackathons focused on entrepreneurial, sustainability and digital innovation, using the Twin Transition Strategy tools.

Teacher Training:

- Design workshops provided through teacher training centres, empowering educators with the practical tools provided and strategies to incorporate Future Green Transition Facilitator competences into their regular teaching modules, adapting flexibly to their curriculum structure and subject matter.
- Offer ongoing support networks and communities of practice for teachers to exchange best practices and innovation regarding sustainability, entrepreneurial and digital transitions.
- Encourage collaborative projects between educators and SMEs, creating real-life learning opportunities and keeping teaching content market-relevant.

Non-Formal Training

Public Employment Services:

- Incorporate cross-cutting modules into reskilling programmes for jobseekers, with a focus on emerging green and digital job profiles.
- Include dedicated retraining programmes incorporating EC4T's four learning paths, delivered via open online training resources accessible through public employment service websites.
- Provide tailored guidance and coaching sessions that support individuals transitioning into green jobs, guided by EC4T training proposal.

Chambers of Commerce / Business Associations:

- Launch targeted training initiatives for reskilling SMEs staff using EC4T's four learning tracks as a base.
- Host introductory seminars prompting participation in the MOOC or specific training modules designed to enhance the digital and sustainable innovation skills of entrepreneurs.
- Organise networking events to share successful transition stories and promote collaboration among SMEs.
- Promote digital badge system to track SMEs' progress and encourage recognition and visibility.
- Establish a regional open-badge registry aligned with Europass to validate and showcase SME staff competences.

Youth Training Programmes:

- Embed Twin Transition modules into regional youth employability strategies and startup incubators.

- Offer openly accessible training resources provided on youth-focused platforms, promoting digital and entrepreneurial skills for sustainability.
- Organise youth mentorship schemes connecting young learners with experienced industry professionals, while developing a Twin Transition strategy.

In-Company Professional Development:

- Integrate EC4T into corporate learning platforms, with tailor-made modules for different departments and levels of seniority.
- Provide regular upskilling workshops and webinars focusing on emerging trends and best practices in digital and sustainable transitions.
- Establish internal innovation labs or 'green innovation hubs' encouraging employees to experiment, innovate, and implement sustainability-driven solutions guided by the Twin Transition tools provided.
- Implement digital badges and internal recognition schemes to reward staff contributions to transition goals.
- Promote continuous learning plans, with built-in feedback loops based on the self-assessment tool to monitor progress and refine strategies.

By adopting and promoting EC4T Learning Paths across these diverse educational contexts, organisations can significantly enhance their strategic capabilities, cultivate innovation, and embed resilience and sustainability into their workforce culture.

The successful realisation of the Twin Transition Strategy outlined by EC4T would be enhanced by a comprehensive and coordinated action at policy level. Policymakers should prioritise frameworks that encourage cross-sector collaboration, creating incentives for SMEs and educational institutions to jointly drive sustainable and digital innovations. Additionally, dedicated funding streams and grants should be made available, facilitating both SMEs and educational entities to implement tailored training programmes and pilot innovative green and digital transition projects.

Finally, integrating the EC4T MOOC and digital credentials into the Erasmus+ and Digital Europe Programme results areas and good practices frameworks can ensure broader reach, sustained engagement, and interoperability of skills recognition mechanisms across Europe.

Furthermore, it is crucial for policy measures to foster an enabling environment for continuous professional development and lifelong learning. Regulatory support for open educational resources and certification programmes can enhance accessibility and recognition of skills acquired through formal and non-formal training pathways. Promoting the adoption of clear standards and benchmarks at the European level will further support consistent progress and the measurable impact of Twin Transition initiatives. By embedding these broader policy recommendations into national and European strategies, governments can significantly amplify the impact of the EC4T

learning methodology, ensuring a cohesive and robust approach to sustainable, entrepreneurial, and digital growth.

EC4T demonstrates how data-driven skills intelligence, micro-credentials and blended learning can accelerate the EU's twin transition. We call on S3 regions, training providers and business networks to join the EC4T adoption community and report progress annually to the Smart Specialisation Platform.

EntreComp for transition

Co-funded by
the European Union