

D3.1 Micro-credentials policy methodology

WP3 - Co-creation of Micro-credentials Policy Methodology



construction



wood-furniture



agriculture



manufacturing



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Document Summary

The MASTERY Policy Methodology represents practical guidance for diverse ecosystem actors on how to apply, develop and deliver micro-credentials in educational systems. The Methodology adopts a straight-forward approach of connecting industry needs and policy vision of the implementation of micro-credentials.

The specific objectives of the MASTERY Policy Methodology include:

- Building consensus of different stakeholders with respect to a common definition of micro-credentials and increasing the social dialogue and the stakeholders engagement in co-creating the micro-credentials.
- Outlining a governance model of applying, developing and delivering the micro-credentials in the selected MASTERY sectors - Agri-food, Manufacturing, Construction, Wood Furniture, Sustainable Management - and, more generally, boosting the capacity building for the creation of networks and partnerships supporting the social dialogue for the micro-credentials implementation.
- Strengthening information monitoring and evaluation of policies and measures to support micro-credentials and disseminating of good practices to foster the transferability of successful measures and policies.

The MASTERY Policy Methodology is organized in three stages – Designing high-quality micro-credentials, Build trust about micro-credentials, Facilitate uptake of micro-credentials - covering 8 visions. In the end, the MASTERY Policy Methodology provides a governance model for applying, developing and delivering microcredentials reflecting the 8 visions and the feedback received from a stakeholder consultation process (8 Policy co-creation groups) organized in five EU countries – Italy, Spain, Bulgaria, Finland and Belgium.

MASTERY POLICY METHODOLOGY

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1. Introduction

The project "Micro credentialS reliability unLEashing gReen economY" - MASTERY aims to revolutionize the use of micro-credentials in support of the twin transition, by rethinking the VET system to better align current job and skill profiles with emerging frameworks. The identification, development, testing and assessment of innovative policy approaches and tools is needed for ensuring mutual application of micro-credential across Europe.

The current Micro-credentials Policy Methodology (referred to as "MASTERY Policy Methodology") aims to develop micro-credentials approaches for improving life-long learning options in industry. It is the first step in setting up the MASTERY paradigm - to navigate multi-stakeholder engagement for consolidating the micro-credential release experiences in Europe. As a process, the MASTERY Policy Methodology steps on research outputs from five countries (Italy, Spain, Finland, Bulgaria and Belgium) and five sectors (Manufacturing, Wood, Agrofood, Building and Sustainable management) and develops an approach for connecting EU visions on micro-credentials to industrial needs. Its results further translate into MASTERY Joint Recommendations (D5.3 of the MASTERY project) - practical steps for stakeholders in developing, applying and delivering micro-credentials.

The MASTERY Policy Methodology encompasses pathways for achieving eight EU policy visions on micro-credentials in line with the identified industry needs. The pathways emerge from a structured co-creation process adopted in MASTERY. It further underlines relevant activities in response to specific challenges in the application of micro-credentials and the roles of the different stakeholders in the processes. The document is intended to serve as a guidebook for stakeholders from the public and private domains - public authorities, industry representatives and educational providers - in their joint efforts towards the roll-out of micro-credentials in Europe.

1.1 Micro-credentials – definition and role in lifelong learning

In 2022, the European Commission published the [Council Recommendation](#) on a European approach to micro-credentials for lifelong learning and employability as an approach to implement micro-credentials to complement and enhance education, training and lifelong learning and employability ecosystems without undermining and

replacing existing qualifications and degrees. As outlined in the Council

A micro-credential is a small, certified learning achievement that recognizes specific skills, competencies, or knowledge gained through short, targeted courses. Unlike traditional degrees, micro-credentials are more flexible, stackable, and often tailored to specific industry or personal development needs. They can be issued by universities, training providers, or professional organizations and are typically verified with digital badges or certificates.

Recommendation:

In the **European Union's lifelong learning strategy**, micro-credentials are seen to play a key role in making education more accessible, inclusive, and adaptable to the rapidly changing job market and supporting lifelong learning across Europe. Their role includes:

- **Upskilling and Reskilling** – Helping individuals update their skills in response to labor market changes, technological advancements, and industry demands.
- **Flexibility and Accessibility** – Enabling learners to acquire skills at their own pace, often through online or blended learning formats.
- **Recognition and Portability** – Promoting standardized, transparent, and cross-border recognition of skills, facilitating employment and mobility within the EU.
- **Support for Inclusion** – Providing opportunities for learners from diverse backgrounds, including disadvantaged groups, to access education and improve employability.
- **Stackability** – Allowing learners to combine multiple micro-credentials towards larger qualifications, such as degrees or professional certifications.

The above-mentioned expected roles for microcredentials imply a strong commitment of all private and public stakeholders who can play a role in their diffuse application, and, in a wider perspective, in the creation of a supralocal supportive environment, (i.e. national and regional public authorities, industry leaders, Education providers at various level). More in details, "Upskilling and Reskilling" implies the reinforcement of the overall capacity building of Education actors, first VET providers, which are requested to rethink their process of designing training programmes and curricula, according to a more modular approach, overcoming the course-centred perspective to switch to learner-centred pathways. Training providers are asked to offer more up-to-date and responsible opportunities, timely adapting to a fast- changing international labour market.

"Flexibility and Accessibility" requests innovation on training methodologies as well as in the delivery models (e.g. blended mode), to meet the needs of the learners in terms of work-life harmonisation, caring or occupational duties. The diversification of methodologies will maximise learning success, meeting a variety of learning styles people might have, boosting "Inclusion and Support". For Education providers at various

levels, especially in VET, this means to innovate methodologies, adopting hybrid delivery modes, and reinforce their international dimension, beside the development and integration of learning management Systems (LMSs). Moreover, all these innovations need to be grounded at organisational level, so Continuous professional development (CPD) of professionals will be essential.

"Recognition and Portability" and "Stackability" imply the capacity of the Skills providers (VET centres, companies, HEIs, etc.) to validate the achievements of individuals learned in any context and to certificate them by using common references and standards, interoperable tools, while guaranteeing methodological rigor, and safe procedures. This approach will allow every person to learn across her/his life, continuously upskilling and updating his/her skills portfolio.

This transformation asks for changes not only from the Training providers' side, but also from the side of other stakeholders: from industries, they shall increase their awareness regarding microcredentials and the possible advantages of their application, for example when it comes to assess or hire a new employee, or when it comes to career development plans of workers, or, again, in the case of skills gap identification. In short, from companies' side, there is the need for legitimization of microcredentials.

Finally, citizens should increase their understanding about microcredentials, what they are and their objectives, especially in terms of portability and stackability. Microcredentials need proper "social recognition".

Public administrators and policy makers, on their side, shall work to innovate policies and adapt technical tools to make microcredentials applicable and mainstreamed.

The European Commission has been actively promoting micro-credentials as part of its [European Skills Agenda](#) and European Education Area. Currently, they become even higher on the policy agenda in the recently published [EU Union of Skills](#), where the European Commission puts micro-credentials in the centre of reskilling and upskilling by stating that it will propose expansion of the use of micro-credentials as flexible learning solutions.

However, the vision of the European Commission is to establish a common approach to the ongoing and emerging provision of micro-credentials in the European Union to improve their quality and transparency and facilitate their uptake on an EU wide scale. Given the diversity of the member states and the differences between the national educational ecosystems, this approach is challenging. Currently, we observe different levels of development of micro-credentials across Europe, with some countries being front-runners and other countries lagging behind.

For example, Ireland, Finland and Germany have gone beyond the EU framework by launching official national portals listing available micro-credentials, improving

transparency and recognition. Spain and Portugal are one step behind by actively integrating micro-credentials into their national quality assurance systems, aligning them with formal higher education regulation. Many EU countries mainly in Western Europe — including Belgium, France, the Netherlands, and Austria—have begun national dialogues and small-scale pilots.

Universities and VET providers often offer micro-credentials, although there's typically no national portal or legal framework in place. Quality assurance is still uneven: mostly managed by individual institutions. In Central and Eastern Europe, a significant number of EU states e.g. Bulgaria, Romania, Slovakia are yet to establish national strategies, portals, or QA frameworks. Their micro-credential ecosystems are largely fragmented, privately driven, and suffer from low visibility and portability across borders.

1.2 Challenges in implementing micro-credentials

As reported, for example in the [ETF Guide to design, issue and recognise micro-credentials](#), even though the European Commission's vision on a common approach to implementing micro-credentials in Europe is well received by different actors, the process is hindered by the complexity of the topic, the lack of knowledge and the lack of full understanding of the innovation potential of microcredentials. This results in different levels of implementation across Europe which are additionally underpinned by several challenges, which were identified during the research on the Micro-Credential Solutions to Boost the Green Skills Match for Industry performed by MASTERY, as well as the co-creation process of this Methodology. These challenges include:

Complexity in legal and policy frameworks

- EU member states have different regulations on education and professional qualifications.
- Ensuring micro-credentials fit within national laws and policies takes time and coordination.

Lack of Common Standards and Recognition

- Different countries and institutions have varying definitions, including terminology: micro-credentials, micro-credits, micro-qualifications etc., and frameworks for micro-credentials.
- The value of micro-credentials is not yet fully recognized by employers and educational providers.

Lack of integration with existing qualifications frameworks including National Qualifications Frameworks (NQFs)

- Aligning micro-credentials with the [European Qualifications Framework \(EQF\)](#) and national systems is complex.
- Ensuring the stackability of micro-credentials (leading to larger qualifications) and transferability across borders is challenging.

Complexity in quality assurance

- There is no universal accreditation system for micro-credentials, making quality control inconsistent.

Segmented ecosystems and lack of dialogue between actors

- Design of high-quality micro-credentials requires integration of the perspectives of multiple actors and establishment of dialogue.

Lack of employer and learner awareness

- Many employers are still unfamiliar with micro-credentials and their value in hiring decisions.
- Learners may struggle to navigate the options available and determine which credentials have real value.

Uncertainties about digital infrastructure and interoperability

- [European Digital Credentials Infrastructure](#) (EDCI) that ensures cross-border recognition.
- Challenges in integrating micro-credentials into available learning management systems (LMS) and digital wallets.

1.3 Objectives of the MASTERY Policy Methodology

The MASTERY Policy Methodology represents practical guidance for diverse ecosystem actors on how to apply, develop and deliver micro-credentials in educational systems. The Methodology adopts a straight-forward approach of connecting industry needs and policy vision of the implementation of micro-credentials (explained in detail in Chapter 2 Policy Methodology – development process) with the main objective of:

Creating common vision and collaboration processes between actors to facilitate the design of high-quality micro-credentials, building trust about them within ecosystems and supporting their uptake for reskilling and upskilling purposes.

The specific objectives of the MASTERY Policy Methodology include:

- Building consensus of different stakeholders with respect to a common definition of micro-credentials and increasing the social dialogue and the stakeholders engagement in co-creating the micro-credentials.
- Outlining a governance model of applying, developing and delivering the micro-credentials in the selected MASTERY sectors - Agri-food, Manufacturing, Construction, Wood Furniture, Sustainable Management - and, more generally, boosting the capacity building for the creation of networks and partnerships supporting the social dialogue for the micro-credentials implementation.
- Strengthening information monitoring and evaluation of policies and measures to support micro-credentials and disseminating of good practices to foster the transferability of successful measures and policies.

The MASTERY Policy Methodology has a clear added value and importance for diverse stakeholders as it intends to provide the guidelines for dialogue and consensus for micro-credentials, unify stakeholders' vision and propose steps for joint implementation. The importance of the Methodology is further underpinned by the different levels of development of micro-credentials across the EU and the need to uniform the approaches between the national educational systems following the European Commission's vision on the process. Therefore, the Methodology can be seen as an important document for advising different actors in the process of applying, developing and delivering micro-credentials in line with the EU policy vision.

With reference to the five expected roles played by microcredentials, Upskilling and Reskilling, Flexibility and Accessibility, Recognition and Portability, Support for Inclusion and Stackability, MASTERY aims at taking on the challenge, by setting and testing a framework (policy methodology, set of EQF5 and 6 training opportunities, upskilling of trainers and practitioners, digital platform working as LMS and microcredentials issuer in coherence with the EU visions and Recommendations), that will support the creation of a joint innovation ecosystem, among partners and beyond.

1.4 Target groups

The MASTERY Policy Methodology is targeted to diverse groups of public and private representatives who have their interest in participating in the micro-credentials development and roll-out. Therefore, a co-creation process has been established for presenting the Methodology to these target groups and receiving their feedback

(validation) on the significance and potential for applicability of the proposed visions. At the same time, the target groups are beneficiaries of the positive impacts the Methodology may create, as shown in the following Table:

Target groups	Interest in participating	Benefits
Industry, companies, business	Having their voice heard about bridging the skills gaps in industry	More accessible, flexible, and affordable educational offerings Certified evidence proving the competencies of workers and candidates during recruitment, evaluation and hiring processes
Educational Providers (VET and universities)	Gaining knowledge on upcoming trends for micro-credentials implementation especially in the green skills	Receiving practical guidance on design and delivery of micro-credentials, while adapting their training design processes and upskilling their trainers
Policy Makers	Better understanding of the industrial and educational landscapes impacting the micro-credentials implementation	Receiving practical guidance on application of micro-credentials and supportive policies for the innovation of the Education systems
Intermediary organizations (industrial chambers, confederations, employment agencies)	Creating better conditions for industry and the labour market development	Actively participating in the dialogue on micro-credentials as an option for reskilling and upskilling of workers

2. Policy methodology – a process of co-development

The MASTERY Policy methodology represents a co-development process between the MASTERY team and the external micro-credentials system, summarized in the flowchart below. The process aims to mobilize the internal MASTERY expertise and to direct it to serve the needs of the educational and policy making systems.

MASTERY POLICY METHODOLOGY Co-development process

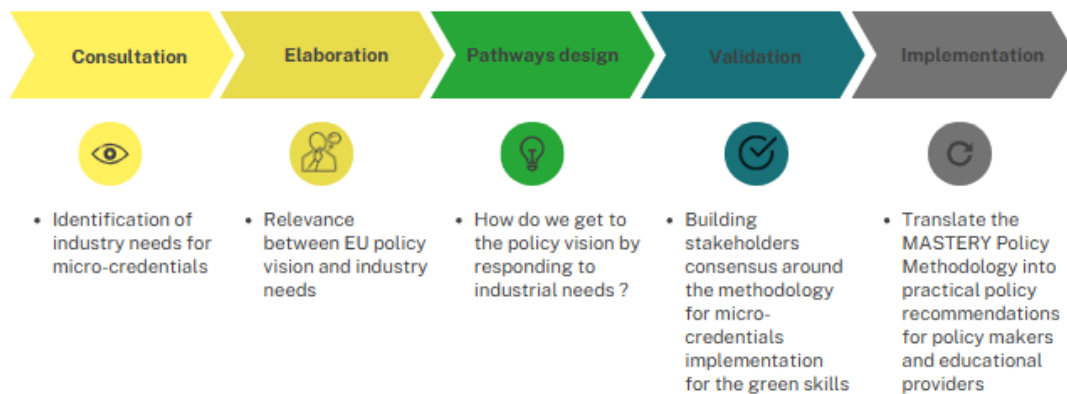


Figure 1. MASTERY POLICY METHODOLOGY - Co-development process

The latter step in the co-development process - the Implementation - represents the follow-up activities which will emerge and will be informed by the Methodology. In practice, it will be applied during the piloting phase of the MASTERY project which will adopt the shared tools and policies for the design of short-term training pathways, centred on enabling green skills, and aimed at providing an unambiguous, traceable certification of the result achieved.

Additionally, the MASTERY Policy methodology along with the lessons learned from the piloting, will serve as a basis for the development of policy content in the format of joint recommendations, to ensure the introduction and proper application of micro-credentials. For that purpose, two approaches will be utilized: one related to VET recommendations to give support to educational providers in their adaptation to this new system; the second one related to policy recommendations to promote micro-credentials in different target groups such as industry, innovation agents, clusters, universities, etc.

2.1 Consultation - Identification of industry needs for micro-credentials

As part of the activities in WP2 "Green skills and knowledge needs in industry, and policies framework for responding to them", the consortium performed a series of tasks for identifying the industry needs and green skills within the targeted sectors – desk research on national policies, survey with industrial stakeholders and interviews with experts and industry representatives. The analysis conveyed opinions and perspectives from a wide range of stakeholders including companies, the [Bulgarian National Agency for VET](#), Micro-credentials policy methodology

[EfVET](#), [WAM](#), NTT Data, etc. The analysis is grounded on long-term dialogue and shared reflections from key actors in the field, during the research stage and shaped the [conclusions](#) produced. These conclusions serve as the basis for reinforcing the MASTERY approach through the current methodology and the subsequent stakeholder consultations during the implementation phase of the project until the end of 2026.

However, particular interest in the development of the current methodology represents the industry needs for micro-credentials. As part of the survey and the interviews performed under WP2, a set of particular needs stated by the industry representatives were outlined. These include (non-exhaustive list):

- The need for public support in skills development especially towards SMEs, which often lack the resources to adopt sustainability principles.
- The need for updated policies and best practices to anticipate future education and training needs.
- The need for identifying green skills gaps that micro-credentials could effectively address, ensuring alignment with sectoral and market requirements.
- The need for green training programs to meet the labor market's expressed skills gaps.
- The need for clear quality assurance and learning outcomes assessment for educational offerings (and micro-credentials in particular).
- The need for involvement of a broad range of key stakeholders in the design of educational offerings.
- The need for awareness raising on micro-credential opportunities among employers.

2.2 Elaboration - Relevance between EU policy vision and industry needs

After the identification of the industry needs, a cross-reference was performed with the statements in the [Council Recommendation of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability \(2022/C 243/02\)](#). This was a key activity of the process whose objective was to define the cross-points where the statements of the Council Recommendation and the identified industry needs meet.

Firstly, the Council Recommendation was carefully examined and statements with relevant impact on the industry were extracted. The main focus was put on the sections:

- Delivering on the potential of micro-credentials.
- European standard elements to describe a micro-credential.
- European principles for the design and issuance of micro-credentials.

These were evaluated as most relevant to the application of micro-credentials from an industrial point of view. Secondly, the extracted statements were applied to the identified industry needs in the comparative table and the cross-points were identified.

Finding the cross-points between the policy vision as expressed in the Council Recommendation and the identified industry needs is a key element in the MASTERY approach aiming to maximise the relevance of the MASTERY Policy Methodology to both the policy making domain and industry expectations.

This serves as a solid basis for the current methodology to design pathways of reaching the policy vision by responding to industrial needs and therefore to incorporate both the policy making perspective and the industrial perspective.

The following table represents the main cross points identified:

Delivering on the potential of micro-credentials – integration in educational and training systems	
Policy vision as outlined in the Council recommendation of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability	Identified industry need
Encourage the inclusion of education and training offers leading to micro-credentials in catalogues of education and training opportunities that are on offer.	Harmonization of micro-credentials systems can be simplified by integrating micro-credentials with existing initiatives at the country level.
Use micro-credentials to improve access to education and training for all learners.	Lack of an effective training culture and significant resistance to change, especially among a segment of the active workforce that missed out on formal sustainability education.
Use micro-credentials to support flexible learning pathways and the transition from upper secondary or VET to tertiary education and adult education.	Another key challenge is the lack of a common European framework supporting the integration of micro-credentials into national education systems.
Use micro-credentials that can be integrated in or that can complement degree programmes.	
Use micro-credentials to support the development of learning for the green transition and sustainable development.	Across the countries and sectors examined, even where green training programs are available, they often fall short of meeting the labor market's expressed needs. Overall, nearly half of all

	respondents indicated they had not received any form of green training.
European standard elements to describe a micro-credential	
Policy vision as outlined in the Council recommendation of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability	Identified industry need
Notional workload needed to achieve the learning outcomes (in ECTS credits, where possible).	As highlighted by the interviewees and the data analysed, the course duration should range between 4 days and one week.
Form of participation in the learning activity.	Frontal lectures and hands-on workshop activities , ensuring that participants gain both theoretical knowledge and practical skills in an efficient, targeted manner. However, experts involved in the research expressed a clear preference for in-person formats to enhance learning outcomes.

European principles for the design and issuance of micro-credentials	
Policy vision as outlined in the Council recommendation of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability	Identified industry need
QUALITY: Micro-credentials are subject to internal and external quality assurance by the system producing them (e.g. the education, training or labour market context in which the micro-credential is developed and delivered).	Conduct follow-up assessments at scheduled intervals (e.g., 3, 6, and 9 months after course completion) to evaluate the long-term retention of skills and the practical application of knowledge gained.
QUALITY: Quality assurance processes must be fit-for-purpose , clearly documented and accessible and meet the needs and expectations of learners and stakeholders.	Assess the learning outcomes of participants through final evaluations (e.g., practical exams, projects, discussions, etc.).
TRANSPARENCY: Micro-credentials are measurable, comparable and understandable , with clear information on learning outcomes, workload, content, level, and the learning offer, as relevant.	Absence of perception of micro-credentials value among industry due to the lack of legitimization by policy makers leading to low awareness about micro-credentials as an option for reskilling and upskilling.

TRANSPARENCY: Systems for micro-credentials should provide transparent and clear information , to underpin guidance systems for learners, in line with national practices and stakeholders needs .	Involvement of a broad range of key stakeholders is needed in the process of development, delivery, and certification of micro-credentials. This involves not only industry, universities, and VET providers but employer and employee representations, public authorities, NGOs, and more.
RELEVANCE: Micro-credentials should be designed and issued as distinct, targeted learning achievements and learning opportunities leading to them are to be updated as necessary , to meet identified learning needs.	Updated policies and best practices: Anticipate future education and training needs by reviewing relevant economic and environmental policy documents.
RELEVANCE: Collaboration between education and training organisations, employers, social partners, other providers and users of micro-credentials is encouraged to increase the relevance of the micro-credentials for the labour market.	Potential rigidities and barriers that can alter the use and diffusion of a micro-credential system are primarily related to insufficient awareness and collaboration between educational institutions and the private sector .
VALID ASSESSMENT: Micro-credential learning outcomes are assessed against transparent criteria .	The final evaluation is crucial for assessing the effectiveness of micro-credential outcomes . Alongside a theoretical discussion, learners could present a simulation or case study reflecting real-life work scenarios.
LEARNING PATHWAYS: Micro-credentials are designed and issued to support flexible learning pathways , including the possibility to validate, recognise and 'stack' micro-credentials from across different systems.	Micro-credentials and Edu badges are seen as valuable opportunities to maintain high levels of engagement in learning activities, for both students and employees. However, the lack of integration between Edu badges and qualification systems represents a barrier to widespread adoption of micro-credentials .
RECOGNITION: Micro-credentials have a clear signalling value of learning outcomes for smaller modules of learning.	Evaluating the long-term effectiveness of the micro-credential system - a structured verification process addressed to attendees and, when possible, gathering insights from employers.
RECOGNITION: Micro-credentials are recognised, where possible, by the	Potential rigidities and barriers that can alter the use and diffusion of a micro-

competent authorities, for academic, training or employment purposes.	credential system are primarily related to a lack of integration between micro-credentials and existing qualification frameworks.
PORTABLE: Micro-credentials are owned by the credential-holder (the learner) and may be stored and shared easily by the credential-holder, including through secure digital wallets.	Use of Edu badges.
LEARNER-CENTERED: Micro-credentials are designed to meet the needs of the target group of learners.	Identifying green skills gaps that micro-credentials could effectively address, ensuring alignment with sectoral and market requirements.
INFORMATION AND GUIDANCE: Information and advice on micro-credentials should be incorporated in lifelong learning guidance services and should reach the broadest possible learner groups, in an inclusive way, supporting education, training and career choices.	Micro-credential knowledge remains limited among employers with more than half of the survey respondents (52%) reporting they are very unaware or unaware of micro-credentials.

Following up on this cross-reference, the MASTERY project performed evaluation of the relevance between the policy visions and the industry needs in the different sectors and geographies – agrifood (Finland), construction (Bulgaria), wood and furniture (Spain), manufacturing (Italy), sustainable management (EU). The partners were asked to assess “How each policy vision can respond to the relevant industry need?” by using three-levels evaluation scale: To great extent, To some extent, Doesn't respond at all. The evaluation aims to bridge the most pressing needs by industry with the strategic priorities of the EU and to emphasise the topics where pathways for applying, developing and delivering micro-credentials will bring most value to industrial ecosystems.

After combining the inputs from all five ecosystems, a prioritization process was performed with the objective to outline the most relevant cross-points between EU vision and industry needs. For the purposes of designing the MASTERY Policy Methodology, only cross-points relevant in 4 out of 5 or in all 5 ecosystems are considered. The final list of cross-points represent a combination of the most relevant policy visions in response to the identified industry needs:

- Create public support to companies to explore the use of micro-credentials for upskilling and reskilling in certain jobs incl. in green training programmes.

- Create **measurable, comparable and understandable** micro-credentials, with **clear information** on learning outcomes, workload, content, level, and the learning offer.
- Design micro-credentials to **meet the current needs** of the target groups in **alignment with sectoral and market requirements** and the **identified green skills gaps**.
- Develop process for **anticipation of future education and training needs** to design and issue targeted micro-credentials and learning opportunities which are **regularly updated**.
- Design **assessment** for micro-credentials in **fit-for-purpose process** including clear **quality assurance** procedures to meet the needs and expectations of learners and stakeholders.
- Create **micro-credential systems** involving a **broad range of stakeholders in transparent processes** of development, delivery, certification and guidance for learners and stakeholders.
- Initiate **processes of recognition** of micro-credentials by competent authorities, for academic, training or employment purposes and potentially initiate **integration within existing qualification frameworks**.
- Incorporate **information on micro-credentials** in **lifelong learning** guidance services to **raise awareness** among employers and to reach the broadest possible learner groups

2.3 Pathways design - application of the Theory of change for the purposes of the MASTERY Policy Methodology

The list of cross-points directly fed into the co-creation process of the MASTERY Policy Methodology, performed by the consortium.

The objective of the co-creation process is to design the integrated pathways between the policy vision and the industrial needs by answering the question "**How do we get to the policy vision by responding to industrial needs?**" for every single cross-point.

Inspired by the [Journey of Progress - Theory of Change card game](#) designed by the team Evaluating Societal Impact (ESI) at Erasmus University Rotterdam, the MASTERY project executed a co-creation exercise for the design of the integrated pathways.

The Journey of Progress – Theory of Change card game addresses challenges caused by transformative collaborations. The tool empowers and enables projects, initiatives, and various organisational units to autonomously build their Theory of Change. Using this approach (in the original format – a card game, in the MASTERY context – canvases) members of a group take a first step towards formalising their understanding on how and why change is supposed to happen in their given context. By back-casting and thinking collaboratively about a joint goal and ways to get there, participants build pathways from

their desirable future to the specific actions needed to realise the necessary steps towards making change.

In simple terms, MASTERY adopted the approach of Journey of Progress and adapted it to its own purposes – to co-create the changes and activities to be triggered by the project in response to the industry needs and towards achieving the policy vision.

The exercise was performed in-person during a transnational meeting and partners were split in groups. Instead of card game, they worked on canvases – one per cross-point with guiding questions for shaping their pathways as follows:

- **CHANGE:** Who must do what differently to achieve the transformation (the cross-point)? – partners could propose up to 2 changes per cross-point.
- **HOW:** What does MASTERY **need** / can **do** to realise the required change? – partners could brainstorm specific project activities that would lead to the change?
- **WHAT:** What is the tangible **result** that contributes to change? – partners could define specific MASTERY results that would support the change.

After the group work, partners got together and presented their ideas. Each group improved their pathways with the feedback received from the other groups. As a result, eight pathways for achieving the policy visions were produced with the specific changes required, relevant activities of MASTERY and relevant results.

The pathways for achieving the policy vision represent the core of the MASTERY Policy Methodology and are further elaborated in Chapter 3 Pathways for achieving the policy vision – the MASTERY Policy Methodology.

2.4 Validation - building stakeholders consensus around the methodology for micro-credential implementation for the green skills

Validation of the Policy Methodology is a key stage in the MASTERY co-development process which will focus on a wide consultation process with stakeholders in the four countries (Italy, Spain, Bulgaria and Finland) and on EU level. The objective of this stage will be to:

- (1) validate the micro-credentials policy methodology and
- (2) build consensus of different stakeholders around the methodology for application of microcredentials in the EU.

In order to achieve comparability of feedback between the different educational systems and a real consensus on the methodology application, the process of validation is coordinated between all partners on a national level and scaled up to EU responsible

structures resulting in 8 events with a minimum of 64 participants in total. The profiles of the targeted stakeholders from the events range from educational providers (both VET and universities) to public authorities, intermediary organizations (employment agencies, social partners) and industrial representatives (companies, businesses).

As outlined above, the objective of the events is to present to the relevant stakeholders the MASTERY Policy Methodology and to build a consensus around it, meaning that the participants are united around the guidelines proposed and feel comfortable to “live with them” and adopt them into future actions. Therefore, the main questions to be targeted during the events are:

1. Which guidelines on how to apply, develop and deliver micro-credentials are applicable/important?
2. What can be improved in the guidelines/the policy methodology?
3. What is unrealistic to be done at the current moment or within the national/EU policy set up?

The events are designed to collect feedback on those questions in both quantitative and qualitative ways - via Slido and facilitated discussion. As a result, MASTERY will consolidate the answers from the different events in a structured way to produce the main topics of consensus achieved.

3. Pathways for achieving the policy vision – the MASTERY Policy Methodology

This chapter represents the eight visions developed by MASTERY in line with the EU Council Recommendation of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability and as response to the identified industry needs. The visions are designed as part of the co-development process detailed in Chapter 2. They are grouped in three macro-categories responding to crucial aspects of micro-credentials application, development and delivery, namely:

- (1) Design high-quality micro-credentials;
- (2) Build trust about micro-credentials
- (3) Facilitate the uptake of micro-credentials for reskilling and upskilling

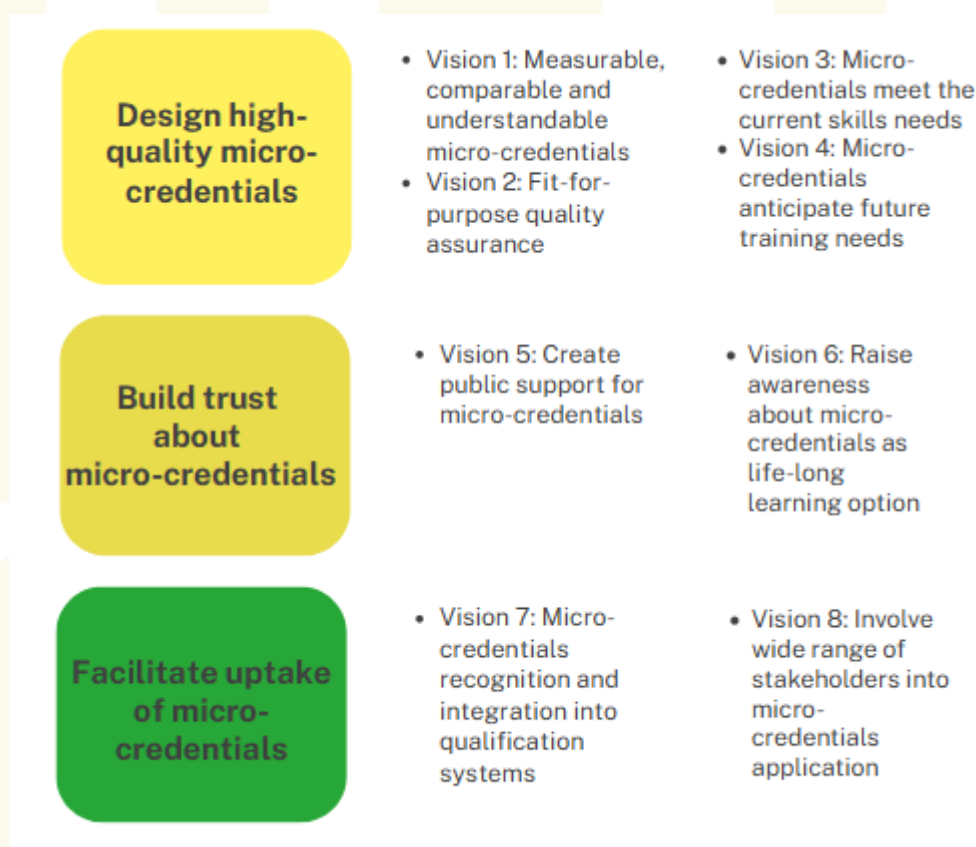


Figure 2: Pathways for achieving the policy vision

3.1 Design high-quality micro-credentials

Designing high-quality micro-credentials for lifelong learning is crucial to ensure that individuals are able to adapt to changing job markets and evolving skills requirements and that reskilling and upskilling initiatives contribute to the strategic priorities of the EU for decarbonization, resilience and sustainable development.

Design of high-quality micro-credentials ensures **credibility and recognition** – they are trusted by employers, educators, and learners and meet industry standards. In terms of **learning relevance and effectiveness**, high-quality micro-credentials are designed to address real-world skills gaps with focus on competency-based learning, ensuring practical and applicable knowledge. The flexibility of micro-credentials enables workers to **upskill and reskill efficiently** without committing to long-term programs and helps them to stay competitive in dynamic job markets.

Additionally, high-quality micro-credentials **improve accessibility and flexibility** as they offer modular and stackable learning pathways, making education more inclusive and thus supporting personalized learning journeys that fit different schedules and career goals. Last but not least, high-quality micro-credentials design encourages **lifelong learning culture** which is a strategic goal for the EU. The advantages of micro-credentials motivate learners to engage in continuous education and support career transitions and professional growth at all stages of life.

The Council Recommendation on a European approach to micro-credentials for lifelong learning and employability outlines the standard elements to describe micro-credentials. However, additional support for the design of micro-credentials is needed specifically to ensure industry and employer relevance in line with the green and digital transition of Europe.

Vision 1: Measurable, comparable and understandable micro-credentials

Challenges on micro-credentials addressed:

Lack of common standards and recognition

Lack of employer and learner awareness

Target groups:

Educational providers

Policy makers

Methodology for reaching the policy vision:

Even though the Council Recommendation of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability sets the stage for the roll-out of micro-credentials in the European Union including the standard elements of a micro-credentials and the principles for design and issuance (definition of mandatory elements for MCs design and release, principles of transparency, quality, stackability, portability, permeability, authenticity, learner-centricity), the document does not provide the specific guidance on how to design micro-credentials as measurable, comparable and understandable units of learning. Therefore, additional support is needed in this regard to inform educational providers and policy makers on how to approach the process. Common standards and tools on how to apply micro-credentials on ground are needed on a central level.

This approach will bring several positive impacts for tackling the identified challenges:

1. The common standards among the Member states will ease the recognition and transferability of micro-credentials between ecosystems and within the single market;
2. It will enhance the awareness of employers and learners everywhere in Europe as common, comparable terminology on micro-credentials will be used regardless of the geography or the educational system.

What we witness until now is that different educational systems approach the Council recommendation differently depending on their level of development thus resulting in segmented ecosystems and hampering the future development of micro-credentials in Europe.

What does MASTERY need / can do to realise the required change:

Under its piloting activities, MASTERY will propose a common approach on how to design and deliver measurable, comparable and understandable micro-credentials. By stepping on the current Methodology, MASTERY will apply the shared tools and policies for the design of micro-credentials for 12 identified green skills based on the industry needs. The

design process will incorporate the mandatory standard elements and principles for micro-credentials as stated in the Council recommendation but will be complemented by additional steps such as:

1. Processing the 12 green skills following the European Skills, Competences, Qualifications and Occupations ([ESCO](#)) referencing atlas: this will guarantee the use of a unique competence-based data set and common descriptors across the E, creating the basis and facilitating mutual recognition and supporting mobility in the EU labour market of individuals and workforce.
2. Customising to MASTERY the European Quality Assurance in Vocational Education and Training (EQAVET) framework indicators: the application of these set of indicators, will support the adoption of common quality standard and will support the diffusion of a culture for continuous improvement of training services, by foreseen business-education partnerships, stakeholders engagement, training for trainers, tailored approach to learning provision and adoption of systemic feedback loops to timely update training offers and support services.
3. Identifying the learning outcomes in compliance with the principles in Annex V to the EQF Recommendation, assuming EQF as a common reference framework of eight levels expressed as learning outcomes, serving as a translation device between different qualifications, frameworks or systems and their levels
4. Selecting In each country, public authorities, target students, VET teachers/trainers, industry representatives so as to support the micro-credential issuance and legitimization.
5. Definition of suitable format of digital tools to certify the micro-credential, able to dialogue with the EU Platforms and all the other Education stakeholders in accordance with the principles of the European Education Area.

The piloting of micro-credentials design and application will be done in four countries - Italy, Spain, Bulgaria and Finland - and on EU level. This initiative will enable the testing of a specific approach for designing and issuing measurable, comparable and understandable micro-credentials, as well as bench-marking of lessons learned between different multistakeholder ecosystems.

What is the tangible result that contributes to change?

MASTERY will produce joint recommendations which, among other guidelines, will accommodate a process of design and application of measurable, comparable and understandable micro-credentials. The process will include design of courses, certification and strategic stakeholder engagement. In the context of MASTERY, the process will be unified, practical and made available for public authorities and educational providers, as well as skills providers to use in their work thus ensuring common standards on EU level, while reinforcing dialogue and mutual recognition mechanisms.

Vision 2: Fit-for-purpose quality assurance

Challenges on micro-credentials addressed:

Complexity in quality assurance

Complexity in legal and policy frameworks

Target groups:

Policy makers

Educational providers

Methodology for reaching the policy vision:

The European Quality Assurance in VET is designed to promote better vocational education and training by providing authorities with common tools for the management of quality. EQAVET includes the need for regular monitoring (involving internal and external evaluation mechanisms) and reporting on progress; uses common quality criteria and indicative descriptors to underpin the monitoring and reporting arrangements; stresses the importance of common indicators to support the evaluation, monitoring and quality assurance of VET systems and providers. However, the adoption and implementation of the EQAVET Framework in the participating countries is voluntary. MASTERY recognizes that EQAVET has the potential to unify approaches to micro-credentials and therefore suggests that national agencies introduce EQAVET horizontally.

This will help develop national rating for micro-credentials or rating of institutions issuing them based on the EQAVET. Additionally, educational providers issuing micro-credentials should act as intermediaries who observe the results of the learners while maintaining constant contact with the public authorities responsible for certification of micro-credentials. Having these intermediaries will ease the process of getting feedback bottom up and report to policy makers thus balancing the needs of the trainees in the long run.

What does MASTERY need / can do to realise the required change:

MASTERY proposes linking the EQAVET framework with micro-credentials in order to create clear guidelines on how to use this tool in the design and delivery of micro-credentials across Europe. Finding the most relevant EQAVET indicators for the purposes of micro-credentials will enable educational providers to continuously improve the learner-centred educational offerings in response to labor market needs and to secure quality of micro-credentials which is an essential principle of the Council Recommendation of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability.

What is the tangible result that contributes to change?

For linking EQAVET and micro-credentials, MASTERY proposes to focus on the following 5 EQAVET indicators to measure the quality as a start:

- Indicator 1: Relevance of quality assurance systems for VET providers.
- Indicator 2: Investment in training of teachers and trainers.
- Indicator 6: Utilisation of acquired skills at the workplace.
- Indicator 9: Mechanisms to identify training needs in the labour market.
- Indicator 10: Schemes used to promote better access to VET and provide guidance to (potential) VET learners

They reflect important aspects of micro-credentials such as continuous update of educational offerings (incl. the capacity of teachers and trainers) in line with the labor market needs, ongoing quality assurance mechanisms as well as adequacy of the VET provision in general, (programmes and supporting/accompanying services to learners/trainees).

Going into the EQAVET quality assurance cycle of "planning – implementation – evaluation – review", micro-credentials fit within several EQAVET descriptors which MASTERY proposes to be further utilized by educational providers in their processes of developing and delivering micro-credentials:

Quality cycle stage	EQAVET descriptor relevant to micro-credentials
Planning	Social partners and all other relevant stakeholders participate in setting VET goals and objectives at the different levels.
	Mechanisms and procedures have been established to identify the training needs of the labour market and society.
	Standards and guidelines for recognition, validation and certification of competences of individuals have been defined.
	VET qualifications are described using learning outcomes.
	Mechanisms are established for the quality assurance of the design, assessment and review of qualifications.
	VET programmes are designed to allow flexible learning pathways and to respond quickly to changing labour market needs.

Implementation	Implementation plans are established in cooperation with social partners, educational providers and other relevant stakeholders at the different levels.
	Guidelines and standards have been devised for implementation at different levels. These guidelines and standards include assessment, validation and certification of qualifications.
	Implementation plans include specific support towards the training of teachers and trainers, including for digital skills and environmental sustainability.
	A national and/or regional quality assurance framework has been devised and includes guidelines and quality standards at VET provider level to promote continuous improvement and self-regulation.
Evaluation	Stakeholder involvement in the monitoring and evaluation process is agreed and clearly described.
	The national/regional standards and processes for improving and assuring quality are relevant and proportionate to the needs of the sector.
	Performance indicators are applied.
	Relevant, regular and coherent data collection takes place, in order to measure success and identify areas for improvement.
	Appropriate data collection methodologies have been devised, e.g., questionnaires and indicators/metrics.
Review	Procedures, mechanisms and instruments for undertaking reviews are defined and used to improve the quality of provision at all levels.
	Processes are regularly reviewed and action plans for change devised. Systems are adjusted accordingly.
	Information on the outcomes of evaluation is made publicly available.

Vision 3: Micro-credentials meet the current skills needs

Challenges on micro-credentials addressed:

Segmented ecosystems and lack of dialogue between actors

Lack of employer and learners awareness

Target groups:

Industry, companies, business

Educational providers

Methodology for reaching the policy vision:

Using a bottom-up approach of bringing together industry and educational providers, so the direct communication between them on the needs is in place. This will allow adaptation of the educational offering to respond to the labour market demands thus resulting in higher interest in micro-credentials. Additionally, this will raise awareness on the value of micro-credentials as a lifelong learning option for reskilling and upskilling.

What does MASTERY need / can do to realise the required change:

MASTERY will pilot micro-credential courses in 12 green skills. Apart from pure pilot testing, integration of stakeholders' perspectives will be secured through their participation in green skills micro-credentials presentations, collecting their feedback and inputs.

What is the tangible result that contributes to change?

MASTERY will deliver new training offers in the format of micro-credentials to close skills gaps in industry in 12 enabling green skills. Additionally, for integrating stakeholders' perspectives in the process, MASTERY will introduce piloting courses performing indicators and customer satisfaction surveys for different profiles involved in the piloting: trainers, VET coordinators and students; companies, policy makers and other relevant stakeholders. This structured process of feedback collection will provide useful insights on how companies and educational providers can collaborate in the design of micro-credentials that meet the current and future skills needs, while making their partnerships sustainable.

Vision 4: Micro-credentials anticipate future training needs

Challenges on micro-credentials addressed:

Segmented ecosystems and lack of dialogue between actors

Target groups:

Industry, companies, business

Educational providers

Policy makers

Methodology for reaching the policy vision:

Micro-credentials are a complex system and, as such, they require multi-stakeholder engagement, especially in the field of adapting educational offerings to future training needs. Collaboration and co-creation between educational providers, industry, public authorities and universities is crucial for the development of mechanisms that accommodate future training needs into the micro-credentials development. The focus of the multi-stakeholder collaboration should be on the organization of roundtables, brainstorming sessions, and knowledge sharing, to find new solutions to emerging training needs. Additionally, observation of past trends and context and their projection into future trends is an important aspect, to guarantee the responsiveness of the MCs recognition methodology: a systematic approach to skills forecasting and skills needs analysis should be applied at ecosystem level, for example, by an expert within the HR department of a company or a unit within an industry representative organization (chamber, confederation), up to public administrators through their skills intelligence system.

What does MASTERY need / can do to realise the required change:

MASTERY can act as an intermediary to support the creation of such a collaborative environment between policy makers, industry and educational providers and to propose approaches for structured collection of feedback. The process will be organized within Kick-start workshops whose aim is to facilitate the dialogue between the stakeholders on policy recommendations implementation and sustainability plan for the design and implementation of micro-credentials. During the Kick-start workshops in 2026, the participants will be trained on the MASTERY paradigm with a view on the development and delivery of 12 green skills micro-credentials. The workshops will be carried out independently in four countries and on EU level but constant dialogue between them will be facilitated by the MASTERY partners to enable synergies, common points in the results, possible points of improvement, etc.

What is the tangible result that contributes to change?

The MASTERY Kick-start workshops will be planned and executed following a methodology for consultation processes and feedback collection for periodical meetings on training needs. After the piloting of the Kick-start workshops and validation of the proposed approach, the methodology will be made available for any public authority, industry representatives or educational providers who would like to follow the process and establish such a multi-stakeholder collaborative environment. The methodology will consist of guidelines detailing how the multidisciplinary Working Groups at country level can engage educational providers, industry, public authorities as well as educational counselling organisations and employment agencies.

3.2 Build trust about micro-credentials

CEDEFOP, the European Centre for the Development of Vocational Training, has been extensively researching micro-credentials, focusing on their role and impact within the labour market. The researches performed by CEDEFOP underline the importance of building trust for micro-credentials as a condition and enabler for future directions of implementation. Building trust about micro-credentials can support:

- (1) Developing a robust ecosystem where companies, educational institutions, and regulatory bodies collaborate is essential for the success of micro-credentials. This involves clear guidelines, quality assurance frameworks, and recognition mechanisms.
- (2) Meeting labor market needs by offering practical, skills-based training that enhances employability.
- (3) Providing opportunities for lifelong learning and social inclusion, thanks to the social function of micro-credentials.

Vision 5: Create public support for micro-credentials

Challenges on micro-credentials addressed:

Lack of employers and learners awareness

Segmented ecosystems and lack of dialogue between actors

Target groups:

Educational providers

Policy makers

Intermediary organizations
(industrial representatives)

Methodology for reaching the policy vision:

Public authorities should make use of research centres, clusters, professional associations, vocational education and training organizations to raise awareness of what micro-credentials are, and how they are used, and why they are useful. The experience of the MASTERY partners shows that there is a challenge in this regard - often there is a missing link between knowing what the real needs of industry are and how to structure those needs with respect to micro-credentials. This is primarily related to the low level of collaboration between industry representatives and policy makers resulting also in slow adoption of policy changes concerning education and training.

By doing this, public authorities will get the chance to navigate the micro-credentials ecosystem within their national set-up and to “walk the talk” between different relevant actors thus achieving combined efforts and aligned vision. The effect of this activity will be three-fold:

1. Public authorities will create collaborative groups of like-minded experts for managing the micro-credentials landscape thus avoiding policy making in silos.
2. Companies, especially SMEs, will operate in a supportive ecosystem where they can easily reach these experts and orientate in the micro-credentials field.
3. Educational providers will get closer contact to research centres, clusters and professional associations which will enable them to adapt educational offerings for micro-credentials to the needs of the industry.

What does MASTERY need / can do to realise the required change:

MASTERY proposes the following guidelines for public authorities on how to establish collaborations with different actors from different systems:

1. **Map the relevant actors in the system:** focus on research centres, clusters, industrial representatives, professional association, large VETs. As a first step, limit the number of actors to max 8-10. The group can be extended further later on.
2. **Evaluate the interest and power/influence** to create support for micro-credentials of all actors, based on the [Stakeholder analysis methodology](#): assign the stakeholders in the four categories of the matrix. Focus on the stakeholders that fall within the quadrant with high power and high interest (up-right) as they will serve as promoters and need to be managed closely.
3. **Get in contact with the identified stakeholders** – set a meeting and present your ambition about building a supportive ecosystem for micro-credentials. Create a common vision together with the stakeholders – how does a supportive system for micro-credentials work? Allocate roles – who should do what? Set the next steps and timelines.
4. **Make stakeholders interaction a regular practice** – identify regularity of meetings, monitoring of activities and progress, planning of next steps.

What is the tangible result that contributes to change?

By introducing a supportive system for micro-credentials managed by public authorities, the results to be achieved within national systems can be quantified via:

- Number of stakeholders that are aware of micro-credentials – this indicator will monitor the effectiveness of the support ecosystem on industry in general and SMEs in particular
- Number of institutions that effectively apply micro-credentials – this indicator will monitor the inclusion of educational providers within the ecosystem and their ability to adequately reflect the industrial needs in the educational offerings.

Vision 6: Raise awareness on micro-credentials as lifelong learning option

Challenges on micro-credentials addressed:

Lack of employer and learner awareness

Unclearities about digital infrastructure and interoperability

Target groups:

Industry, companies, business

Intermediary organizations
(industrial chambers,
confederations, employment
agencies)

Methodology for reaching the policy vision:

On employers' level - Employment agencies and industrial partners such as chambers and confederations should help companies understand the value of MCs because they are the intermediaries between policy change and labor market. This awareness raising can be done through info days, dedicated communication campaigns together with public authorities, and visibility of the topic in the media.

On learners' levels - Already at high school and different school levels, orientation services can share micro-credentials opportunities among students as a possibility for acquiring skills incl. after apprenticeships in dual systems. Currently this practice is not fully utilized and it has the potential to generate awareness at a young age, thus providing future workers with the mindset to explore different options for continuous reskilling and upskilling in their future careers.

By doing so, interest among both employers and learners will be generated, leading to better matching the demand, (the expectations from businesses on what the workforce can deliver as skills), with the supply, (the provision of these skills by workers). In order for this to happen successfully, both groups - employers and learners - should refer to the same standards for recognition of skills and, in the field of micro-credentials, this is digital certification of skills (digital badges). This is an excellent "selling point" for micro-credentials as it will increase the interest of both groups - communicating a clear result (digital badge) that the learners can acquire and the employers can recognize will make a better match for employability.

What does MASTERY need / can do to realise the required change:

MASTERY will create digital badges attributed to the different micro-credential courses. During the piloting phase, MASTERY will test how communicating the value of digital

badges to learners and intermediary organizations can impact the awareness on the value of micro-credentials both among workers and employers.

What is the tangible result that contributes to change?

Companies demand this kind of certification when an individual applies for a job to demonstrate relevant skills.

3.3 Facilitate the uptake of micro-credentials for reskilling and upskilling

Even though the Council Recommendations of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability are available and give excellent basis, the facilitation of the uptake of micro-credentials is not an easy task in the EU and different countries show different levels of development. However, it is of utmost importance to support this complex process, as it will lead to recognition by employers, learners confidence and higher education and training providers credibility.

The facilitation of micro-credentials uptake should represent a coordinated effort within the educational systems that steps on integration into recognized qualification systems such as national qualification systems (top-down approach) and involves a wide range of stakeholders (bottom-up approach). Without these two, it will be extremely difficult to utilize the benefits of micro-credentials such as their recognition, workforce relevance and simplified educational landscape.

Vision 7: Micro-credentials recognition and integration into qualification systems

Challenges on micro-credentials addressed:

Lack of integration with existing qualifications frameworks incl. National Qualifications Frameworks (NQFs)

Complexity in legal and policy frameworks

Target groups:

Policy makers

Methodology for reaching the policy vision:

Ministries of education and other relevant public authorities should identify which educational providers are the most adequate to identify, validate and recognize micro-credentials. And additionally, a second change is to clarify on a national/regional level who will make the certification of micro-credentials. This will give a clear structure of responsibilities within the micro-credentials ecosystem along with a clear picture of the role of different actors. By doing this, systems will become more adaptable to future

changes of micro-credentials set up and additionally, upon emerging skills needs, which are expected to come as a result of the green and digital transition, there will be already a designed pathway of how the new educational offerings will be accommodated within the existing ecosystem.

What does MASTERY need / can do to realise the required change:

The MASTERY project can help to identify the most relevant actors, to suggest how the certification process can be done and to increase their awareness of the micro-credentials ecosystem in general.

What is the tangible result that contributes to change?

The approach of MASTERY in supporting this process will be twofold. Firstly, a series of stakeholder engagement workshops will be organized to test the approach of policy co-creation in the different ecosystems. Secondly, all lessons learned will be integrated into the MASTERY joint recommendations aiming to ensure the introduction of micro-credentials. For that purpose, MASTERY will produce VET recommendations - to give support to VET centres for their adaptation to this new system; and policy recommendations to promote micro-credentials in different target groups such as industry, innovation agents, clusters, universities, etc.

Vision 8: Involve wide range of stakeholders in micro-credentials application

Challenges on micro-credentials addressed:

Segmented ecosystems and lack of dialogue between actors

Lack of common standards and recognition

Target groups:

Industry, companies, business

Educational providers

Policy makers

Methodology for reaching the policy vision:

Bringing different actors together is essential for open debate involving governments (national and regional), companies and educational providers. Additionally, they need to use the same language – terminology for micro-credentials is very diverse across Europe. Words such as “micro-credits”, “micro-certificates”, “micro-certifications”, “micro-qualifications”, all refer to micro-credentials and they are, in principle, correct, but represent interpretative translation from English. While widely used in combination, (including using more than one term in the same policy document), this causes confusion among stakeholders and hampers productive dialogue.

In the complex context of micro-credentials, where stakeholders experience low awareness and confusion, bringing additional layers of diversification does not make things simpler. Unification of terminology is crucial within the national ecosystems meaning that each national ecosystem should choose and use only one word in the native language when referring to micro-credentials. This will support the creation of higher awareness and common language within the ecosystem.

What does MASTERY need / can do to realise the required change:

MASTERY will, through its activities, facilitate active multi-stakeholder dialogue at different stages and with different scopes. As a start, the organization of Policy co-creation groups in 2025 sets the scene for stakeholder collaboration on the topic of micro-credentials and touches upon all the approaches proposed in the current Methodology, seeking validation and feedback from policy makers, industry and educational providers. Already at this stage, MASTERY initiates the discussion on adopting common terminology for micro-credentials in each country. At a later stage, stakeholders will be engaged in Kick-start workshops which will raise awareness on the MASTERY paradigm of applying, developing and delivering micro-credentials.

What is the tangible result that contributes to change?

The events listed above will be planned and facilitated by MASTERY. But in order to flourish a self-sustained process, MASTERY has produced clear standards on how to establish and run multi-stakeholder dialogue on micro-credentials. In the case of setting up a multi-stakeholder group on micro-credentials, the group will take the format of "Engaged partnership" meaning that all stakeholders have influence in the process, but the policy makers take the final decisions. The standards for establishing and running a multi-stakeholder group on micro-credentials are the following:

STAGE 1: Setting up a multi-stakeholder group

1. Stakeholder mapping and stakeholder engagement
 - Please, refer to Vision 5 for ideas on how to map and engage stakeholders
2. Structure of the group incl. governance and coordination
 - Use an open structure for the group which allows to continuously adapt the composition. On the basis of identified needs, an open membership allows increased participation with relevant new stakeholders making ad hoc interventions on a specific topic or joining the group's activities at any point
 - Appoint coordinator – an expert from the public authority who is an organizer, a motivator, a mediator and a manager so a smooth process is ensured.

STAGE 2: Running a multi-stakeholder group

1. Create a roadmap

- Clear vision on objectives and expected results/outputs, definition of the policy challenge to be addressed by the group, timetable for meeting dates, a visual timeline highlighting the main steps, members responsibilities and/or tasks, outline of the work plan for the development of the activities.

2. Organize successful and efficient meetings

- Prepare and circulate agenda, facilitate the meeting (introduce the objective, document discussions, wrap-up the outcome, summarise next steps).
- Report and capture knowledge through sharing of regular updates

3. Maintain commitment of stakeholders.

- Sharing progress and showcasing results on a regular basis, adapting the group composition as appropriate, repetition of the stakeholder mapping exercise on a regular basis to assess stakeholders interest in participating, demonstrating results and impact of the group's work.

Checklist for setting up and running a multi-stakeholder group on micro-credentials

Have you identified who could be the stakeholders?	
Are they interested in the topic of micro-credentials? Do they understand and support it?	
Have you carried out analysis of your stakeholders?	
Are there any stakeholders with conflicting views, expectations or requirements?	
Have you identified and taken actions to engage your stakeholders?	
Are your stakeholders all clear about their own roles and responsibilities and the roles of others?	
Do you have a governance structure that includes all the main stakeholders that should be involved?	
Has a coordinator been appointed?	
Is there a clear vision, with objectives and defined results for the group?	
Do all stakeholders understand that vision and share it? Is there a common understanding of the objectives?	
Do you know how you will communicate progress to stakeholders and beyond?	

4. Governance model of applying, developing and delivering micro-credentials

The current MASTERY Policy Methodology represents the vision of the MASTERY project of how micro-credentials should be applied, developed and delivered across Europe. It is the framework of reference for all stakeholder groups to consider regarding their roles, responsibilities and activities in the process of putting micro-credentials approach ahead as a main lifelong learning option for reskilling and upskilling. In this regard, the MASTERY Policy Methodology will help create a supportive environment for micro-credentials providing a governance model as a strategic approach to further roll-out in Europe. It will integrate the feedback received from the Policy co-creation groups in terms of most applicable and realistic visions to be achieved in the first place as well as pathways for improvement of the approach.



Figure 3: The process-oriented approach of the MASTERY Policy Methodology

As indicated above, the MASTERY Policy Methodology adopts a process-oriented approach structured on development of the visions in response to different micro-credentials stages: Design high-quality micro-credentials, Build trust about micro-credentials, Facilitate the uptake of micro-credentials for reskilling and upskilling trust about micro-credentials. However, during the implementation of the Policy Co-creation groups (8 workshops, organized in 4 countries - 2 workshops in Italy, 2 in Spain, 2 in Bulgaria, 1 in Finland - and one workshop on EU level with a total of 86 participants from public authorities, industry, intermediary organizations and educational providers) which aimed to validate the methodology, new real-life perspectives were integrated leading to the prioritization of some visions over others as more important and realistic.

The policy co-creation groups were organized in different countries with different levels of development regarding micro-credentials. All workshops of the policy co-creation groups adopted the same methodology for collection of feedback and validation of the MASTERY Policy Methodology for allowing comparability of results between the different ecosystems. This is done with the purpose to design a common pathway of applying, developing and delivering micro-credentials in Europe which informs the MASTERY governance model and suggests the steps, the responsibilities and the way forward.

MASTERY Governance model context

The MASTERY Governance model of applying, developing and delivering micro-credentials aims to support the roll-out of micro-credentials in Europe making them a natural option and first choice for reskilling and upskilling in a lifelong learning perspective. For doing so, the governance model takes a holistic approach on the educational ecosystems acknowledging the importance of engaging policy makers, industry, business and companies, educational providers and intermediary organizations as key stakeholders in the process. The application of micro-credentials will not be possible if any of the groups is excluded. At the current stage, the countries in Europe experience different levels of advancement in micro-credentials ranging from segmented single-pilot application to centralized adoption and integration in the educational ecosystems. This comes to underline the fact that there is no single approach to micro-credentials on a country level which poses challenges for their massive roll-out and unification of approaches.

Despite the different levels of advancements, all Policy Co-creation groups outlined common first steps for approaching the micro-credentials application. From their perspective, the most important actions (related to the specific visions) to be taken in the educational ecosystems are the establishment of widely spread culture for micro-credentials stepping on the:

- **development of common frameworks and guidelines for EU micro-credentials application,**
- **unification of terminology and**
- **strong multidisciplinary cooperation engaging a wide range of stakeholders.**

As highlights, the Italian stakeholders emphasized on the importance of definition of common tools and multidisciplinary of the actors engaged, while in Spain, where challenges about fragmentation of terminology are in place, the unification of language appeared as most significant to be achieved. In Bulgaria, where the general framework for micro-credentials is still missing, the stakeholders underlined the important role of responsible public bodies to introduce and implement the first steps in this regard. On the contrary, in Finland, whose educational system is among the advanced ones in Europe with respect to micro-credentials, stakeholder interaction was seen as the most

important way to promote the development of micro credentials. On EU level, it is recognized that the "skills discourse" is deeply interconnected with "business models" and "public awareness" therefore holistic approach is necessary.

Based on the approaches proposed in the MASTERY Policy Methodology, the outcomes from the Policy Co-creation Groups underline the significant role of the policy makers for the process of applying, developing and delivering micro-credentials. However, they are not standing alone and need to be supported by industrial and educational stakeholders in building multidisciplinary cooperation.

MASTERY Governance model structure

The MASTERY Governance model adopts a federated model that leverages the strengths of both centralized and decentralized models. The reasoning behind that is the fact that micro-credentials should be first regulated on a policy level with the associated frameworks and tools designed by policy makers. Practical application, on the other hand, should happen within the established frameworks, but should in the first place serve the needs and demands of the industry by mobilizing the existing capacities within the educational sector. Therefore, the federated model reflects these specifics and correlates to the establishment of a central governance for overall strategy and policies, while empowering industrial and educational stakeholders to manage and execute within that framework, fostering both consistency and agility.

In the context of the identified important actions for applying, developing and delivering micro-credentials, namely the development of common frameworks and guidelines for EU micro-credentials application, the unification of terminology and the strong multidisciplinary cooperation and in line with the adopted federated governance model, the roles and responsibilities among the stakeholders can be generalized as follows:

Policy makers:

- create the general framework and the guidelines on what micro-credentials are, how they should be structured, and who is eligible to deliver them;
- act as a bridge between the EU trends and national developments;
- introduce unified terminology;
- raise awareness and facilitate stakeholder engagement.

Industry, companies, business

- participate in stakeholder engagement processes

Educational providers:

- support policy makers in the development of guidelines,
- test and pilot micro-credentials offerings

Intermediary organization (industrial chambers, confederations, employment agencies)

- participate in stakeholder engagement processes

Given the federated governance model for applying, developing and delivering micro-credentials, the roles and responsibilities are distributed among the stakeholders who have the autonomy to make decisions relevant to their specific context. In practice, this means that policy makers need to create a national or regional micro-credential policy framework (framework development) and this was validated by the feedback received from the Policy co-creation groups in Italy, Bulgaria and Spain as urgent and important step.

Policy makers should define accreditation standards and align with existing qualification frameworks, promote mutual recognition across institutions and borders and ensure monitoring and evaluation by tracking outcomes, adoption rates, and workforce impact through multidisciplinary dialogue. The latter is confirmed by the feedback received in the Policy Co-creation groups in Finland, Spain and on EU level where building cooperation between key actors (education providers, employers, governments) is emphasized as the most realistic step to be applied. This will contribute to boost a “cultural approach to micro-credentials. On a general basis, policy makers are the ones to create the supportive framework for the application, development and delivery of micro-credentials.

Industry, companies and businesses on the other, are instrumental for skills forecasting and more specifically for identification of current and emerging skills and job roles through labor market data. Industry should be actively involved in the co-design curriculum to ensure relevance. Additionally, the industry is the one to endorse micro-credentials and to boost credibility and employability. Last but not least, work-based learning provided by industry has the potential to offer practical learning settings and recognition in hiring by acceptance and integration of micro-credentials in recruitment, promotion, and HR systems. All these are of utmost importance to secure the adequacy of micro-credentials in bridging skills gaps.

Educational providers are the ones to adapt training offerings to the existing frameworks and industrial needs. In this sense, their responsibility ranges from curriculum design – translation of industry needs into learning outcomes and content – to offering flexible, modular, and stackable education and training, using robust, competency-based assessments and issuance of secure, portable digital badges or certificates. Educational providers are also a powerful group to provide guidance, upskilling pathways, and career advice to learners.

According to the feedback received and the consensus built during the Policy Co-creation groups, the process of roll-out of the suggested visions is anticipated to be structured as follows:

Stage/step	Vision	Targeted stakeholders	MASTERY tangible result
1. Facilitate uptake of micro-credentials: Create multidisciplinary working groups to coordinate micro-credentials implementation incl. unification of terminology	Vision 8: Involve wide range of stakeholders into micro-credentials application	Industry, companies, business Educational providers Policy makers	Clear standards on how to establish and run multi-stakeholder dialogue on micro-credentials in the format of "Engaged partnership"
2. Design high-quality micro-credentials: Develop common frameworks and guidelines for EU micro-credentials application	Vision 1 Measurable, comparable and understandable micro-credentials	Educational providers Policy makers	Design of courses, certification schemes and strategic stakeholder engagement and the associated methodological approach in the format of joint recommendation reflecting the activities of WP4 Pilot actions for testing of micro-credential policy methodology and WP5 Roll out of the policy recommendation
3. Build trust about micro-credentials: Public authorities to make use of research centres, clusters, professional associations, VET organizations to raise awareness on micro-credentials and their usefulness	Vision 5 Create public support for micro-credentials	Educational providers Policy makers Intermediary organizations (industrial representatives)	Creating a supportive system (through stakeholder engagement and MoUs) for micro-credentials for raising awareness and quantifying the effectiveness of the support ecosystem on industry in general and SMEs in particular. Monitoring the

			number of institutions that effectively apply micro-credentials.
4. Design high-quality micro-credentials: Structured process for integrating stakeholders' perspectives into micro-credentials' design	Vision 3 Micro-credentials meet the current skills needs	Industry, companies, business Educational providers	MASTERY will deliver new training offers in the format of micro-credentials to close skills gaps in industry in 12 enabling green skills.
5. Design high-quality micro-credentials: Standards on establishment of the multidisciplinary Working Groups for stakeholder dialogue on micro-credentials and anticipation of skills needs	Vision 4 Micro-credentials anticipate future training needs	Industry, companies, business Educational providers Policy makers	MASTERY will organize kick-start workshops whose aim is to facilitate the dialogue between the stakeholders on policy recommendations implementation and sustainability plan for the design and implementation of micro-credentials.
6. Build trust about micro-credentials: Promotion of digital badges attributed to the different micro-credential courses as a way to raise awareness on micro-credentials as lifelong learning option	Vision 6: Raise awareness about micro-credentials as life-long learning option	Industry, companies, business Intermediary organizations (industrial chambers, confederations, employment agencies)	MASTERY will create digital badges attributed to the different micro-credential courses. During the piloting phase, MASTERY will test how communicating the value of digital badges to learners and intermediary organizations can impact the awareness on the value of micro-credentials both among workers and employers.

7. Facilitate uptake of micro-credentials: Support in identification of the most relevant actors to identify, validate and recognize micro-credentials and support in shaping the certification process for integration with qualification frameworks	Vision 7: Micro-credentials recognition and integration into qualification systems	Policy makers	MASTERY organized a series of stakeholder engagement workshops to test the approach of policy co-creation in the different ecosystems. All lessons learned will be integrated into the MASTERY joint recommendations aiming to ensure the introduction of micro-credentials - VET recommendations to give support to VET centres for their adaptation to this new system; and policy recommendations to promote micro-credentials in different target groups such as industry, innovation agents, clusters, universities, etc.
8. Design high-quality micro-credentials:	Vision 2 Fit-for-purpose quality assurance	Policy makers Educational providers	For linking EQAVET and micro-credentials, MASTERY proposes to focus on the following 5 EQAVET indicators to measure the quality reflecting the quality cycle stages of planning – implementation – evaluation – review

5. The MASTERY strategic approach to micro credentials unleashing green economy

As repeatedly stated, since the introduction of this Policy methodology, the project "Micro credentialS reliabiliTy unlEashing gReen economY" - MASTERY aims to revolutionize the use of micro-credentials in support of the twin transition, by rethinking the VET system to better align current job and skill profiles with emerging frameworks. The identification, development, testing and assessment of innovative policy approaches and tools is needed for ensuring mutual application of micro-credential across Europe.

MASTERY aims to create a supportive environment for micro credentialling key skills boosting the transition to green economy models by offering a structured process to be followed based on the main steps of the EQAVET quality cycle (PLAN, DO, CHECK, ACT). The process emerges from the research-based activity (D2.2 Research Report on the Micro-Credential Solutions to Boost the Green Skills Match for Industry), aimed at identifying a set of 12 enabling green Skills for green innovation, across main sectors and at ecosystem level, and from the development and validation of the 8 policy visions on micro-credentials coming out from the carried-out co-creation processes. The structured process can be summarized as follows:

PHASE	WHAT	WHO	HOW	WHERE	VISION
PLAN	Continuous detection and analysis of skills demand	VET providers, industry representatives Policy makers	Through a multisource coordinated action: Identifying key stakeholders to be involved in the co-design process Identifying and mapping the multiple available sources for data and information (Observatories, Skills intelligence systems,	At ecosystem level (local, regional, national, up to international)	Vision 3: Micro-credentials meet the current skills needs Vision 4: Micro-credentials anticipate future training needs Vision 1: Measurable, comparable and understandable micro-credentials

			research and studies, etc. Organising round tables for discussion, workshops or events to engage companies/industry leaders to investigate how micro-credential frameworks can deliver value across several key beneficiary categories		
	Training of trainers VET professionals	VET providers, in cooperation with industry, Universities and research	Periodical upskilling interventions for continuous professional development (CPD)	At various level, from local up to international, according to a "glocal approach" to training	Vision 6: Raise awareness on micro-credentials as lifelong learning option

MASTERY assumes that to support the creation of robust skills ecosystems for the green transition, what is needed is the continuous detection of skills demand from companies, since they need high-skilled workforce to make economies move forward.

MASTERY affirms the importance of identifying emerging skills by following a logic of defining micro-credentials already in the emerging skills planning phase, to intervene with upskilling and reskilling plans that respond more precisely to the interests of the individuals, companies and communities.

The microcredential system in fact enhance individuals in career visibility at transnational level, and market positioning through clear skill documentation and recognition. For organizations, micro-credentials enable more precise human capital planning by providing granular data on available competencies that align with evolving market demands. At the community level, micro-credential systems facilitate targeted upskilling program development, strengthening local knowledge ecosystems and enhancing regional economic competitiveness through improved workforce capabilities. This means identifying emerging needs and designing a self-consistent skill that is not redundant with the skills already present in the individual's profile and

can be traced back to an ESCO skill to ensure greater transferability and recognisability of the skill in transnational contexts.

A continuous skills forecasting activity can be realised at different level, from local up to international, to see how sectors and the overall labour market have been changing. The main aim, on one side is, in fact, to be able even to anticipate skills' evolution, to make VET providers capable to accompany industries in finding prepared workers in a fast-changing competitive economy. The mentioned both systematic and systemic approach to skills' evolution represent a powerful leverage for:

- Increasing the critical mass of enabling green skills available on the market, since research and study have confirmed that they still lack and that workers need upskilling and reskilling opportunities to contribute to the green transition.
- Increasing the general available knowledge, sensitivity and social recognition of requested enabling skills, with a particular attention to the green ones.
- Creating a common understanding and culture regarding micro credentials to safely and timely certificate competencies achieved by everyone after qualified learning experience in any context, formal, non-formal, informal, according to a tailored approach to training, able to make workers quickly mobilise their certified achievements. The multistakeholder dialogue on emerging skills and micro credentials certified to them, through common standards (unified terminology, shared tools, shared procedures), will also supports the social recognition of the value that micro-credentials can have on the labour market.

On a wider perspective the dialogue with Policy makers, first regional and national can be crucial to capitalise experimentations on Green Skills recognition and Micro-credential certification schemes tested. Moreover, this dialogue can support the creation on new policies, establishment of coordination table between VET, University, Industry and governance actors, as well as the formalization of collaboration agreements and MOUs for joint efforts and initiatives of public-private partnerships, (es. Agreements with certification bodies at national and regional level, etc).

Beside considering the relationship with companies and industrial leaders foundational for effective skills needs analysis, and consequent more responsive VET systems and training curricula, MASTERY assumes the continuous upskilling and professional development of VET professionals, teachers and trainers as crucial to boost the green transition, innovation of curricula and the overall increase of capacity building of VET providers. Updated skills of professionals will allow them to design and implement training programmes and supporting services close to the need of the socio-economic operators and the need of the labour market. Besides, since micro-credential courses request an ad- hoc design, upskilling processes will help VET professionals to conceive

training programmes for the realisation of MCs, for transparency and certification of achievements acquired by everyone. Upskilling of professionals will also facilitate dialogue with companies, industry leaders and Business Support Organizations in detecting emerging needs in terms of skills and training services. Under this perspective, the periodical organisation of so-called “Kick-start workshops” to introduce and explain the MASTERY approach to professionals and other key stakeholders, will play a crucial role in creating a robust common body of knowledge on the enabling green skills and MCs topics.

Finally, after attendance of upskilling sessions, VET professionals can have their competencies certified through micro-credentials as well.

PHASE	WHAT	WHO	HOW	WHERE	VISION
PLAN	Training and MCs design	VET providers, industry representatives Other relevant stakeholders (es. BSOs, Clusters, research Centres)	Micro credentials courses co-design and business-education partnerships Applying and evidence-based approach to training since the design phase	At VET provider's level organizational at local/regional /national ecosystem level	Vision 1: Measurable comparable and understandable micro-credentials Vision 2: Fit-for-purpose quality assurance Vision 6: Raise awareness on micro-credentials as lifelong learning option
	Training toolkit's preparation	VET providers (VET professionals and filed experts)	Set of multichannel training materials supporting the achievements of the different micro-credential courses.	At micro-credential course level	Vision 2: Fit-for-purpose quality assurance
	Design of procedures to recognise	VET providers, industry representatives	Specific set of procedures to evaluate competencies	At micro-credential course level	Vision 2: Fit-for-purpose quality assurance

	and release micro-credentials	ED Tech partners, Other relevant stakeholders (e.g. companies, policy makers)	, to validate, recognise and formally certificate them.	At governance level	Vision 5: Create public support for micro-credentials Vision 7: Micro-credentials recognition and integration into qualification systems
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According to the MASTERY strategic approach, the training design phase must respect quality criteria, first through the identification and definition of clear learning objectives and learning outcomes., second, and consequently, to define clear evaluation methodologies, tools to be used and assessment criteria. This rigour is foundational both for tailored and responsive training, and for the design/identification of Measurable, comparable and understandable micro-credentials (MCs) to be realised after attendance and assessment. This evidence-based evaluation must be designed in the conception step of each training course/opportunity. Moreover, it is worthwhile to confirm, that business-education partnerships are essential for MASTERY, since the design phase of the training courses.

Companies, industry leaders and BSOs, can cooperate in the co-creation step of the courses through their field experts/technicians, playing the role of content's experts or experts of sectoral processes. Besides, in a delivery perspective, companies can offer learning experiences to learners, e.g. through challenge-based activities, hosting study visits and/or sharing laboratories/virtual laboratories for project-based learning or work-based learning.

For responsive microcredential courses, the quality of the training/supporting materials is also crucial, to maximise inclusiveness and achievements. Since microcredential courses develop according to a long-life learning perspective, boosting upskilling and reskilling processes among targets and individuals, prioritization of blended training will allow to maximise flexibility in delivery, meeting the needs of employees, workers, women, etc. The prioritization of hybrid modes must be designed in the development phase of the courses to integrate methodologies, contents, timing and integrate the different settings. With reference to training materials, this means to conceive a set of multichannel supports (e.g. presentations, videos, quizzes, etc.), then can be organically accessed through a customised Learning Management System (LMS).

Since MCs certificate competencies or elements of competencies, and competencies to be assessed must be observed in action, a clear definition in the training design phase of evaluation steps, tools and objectives, as mentioned above, is extremely relevant. In the case of blended courses, It is necessary to clearly identify what and

how must be assessed, in order to collect the correct and meaningful evidence,, proving the various achievements, which will be certified through MCs, at the end of learning path. Clear procedures to evaluate, validate and certificate competencies through MCs represent a milestone according to the MASTERY strategy. On a wider perspective, at this stage, meeting and discussion with public administrators and policy makers might be relevant, for "institutional validation of the developed procedures" that can be integrated in the regional/national Certification systems. Ad hoc agreements can be formalised, for example to include the developed procedures in the authorised ones, applicable also in the context of funded training courses (e.g. European Social Funds (ESF).

MASTERY also fosters integration of MCS in the qualification frameworks, to make more agile formalization and certification processes and in line with stability and portability dimensions of MCs. This might be crucial, to increase transparency on one side and possibilities for individuals, not only within the same "education filed/segment", but also across the different fields of education (permeability. Moreover, increasing portability and permeability also can increase the capacity of various education sub-systems to dialogue across countries, for a European Education Area.

PHASE	WHAT	WHO	HOW	WHERE	VISION
DO	Delivery of microcredential courses	VET providers, industry representatives Other relevant stakeholders (es. BSOs, Clusters, research Centres) providing expertise Public administrators/ policy makers Ed Tech for updating and maintenance of adopted LMS	Implementing the training courses with the target groups and according to the methodological approach followed in the design phase. And releasing the MCS to each participant after positive assessment. Promoting LLL opportunities and the value of MCs	At microcredential course level At ecosystem level	Vision 1: Measurable comparable and understandable micro-credentials Vision 2: Fit-for-purpose quality assurance Vision 6: Raise awareness on micro-credentials as lifelong learning option Vision 8: Involve wide range of stakeholders

					in micro-credentials application
The delivery phase of the microcredential courses, according to MASTERY, must follow and respect the design principles and criteria followed in the conception phase. Direct collaboration in delivery with companies (industrial leaders, industrial researchers, specialised technicians), can support the overall quality and responsiveness of faces training topics/subjects. With reference to the MASTERY enabling Green Skills, companies, beside field expertise for training and teaching, can provide case studies to be analysed and discussed by trainees., to make training "hands on" and effective. Scientific contributions can be provided from various stakeholders, from Universities to research centre, to innovation hubs representatives or clusters. Under this perspective, during implementation, quality of the training provided is the result of a joint multistakeholder effort and continuous dialogue, which help in the overall process of creation of trust on micro-credentials and unification of language/terminology, that interviewed stakeholders, (see previous section of the MASTERY Policy Methodology referring to implemented local consultations under WP3), considered as priorities to recognise MCs' value. During implementation of the courses, providers shall carry out a crosscutting evidence-based evaluation process, (e.g. through summative evaluation), to collect proves of successful achievements. This transversal assessment will play a crucial role for the realise of valid MCs, attesting marketable competencies of people, on the labour market. To carry out the above-mentioned evidence-based assessment, well-structured digital procedures for the certification of achievements through the release of MCs, represent a fundamental requirement according to MASTERY. Digital procedures can be affordable, safe, secure and issues certificates/credentials must be personal, verifiable and authentic. While delivering the courses, since MASTERY assumes MCs constitute a relevant mean to support Life-Long-learning, Vet providers and other involved stakeholders might promote the courses and their achievements at ecosystem level.					
PHASE	WHAT	WHO	HOW	WHERE	VISION
CHECK	The MCs for enabling green skills are integrated into the training courses provided and comply	Training institutions, public authorities with responsibility for VET, certification bodies.	Identification of MCs as a tool for designing and delivering training at training institution level.	VET Provider level	Vision 2 Fit-for-purpose quality assurance

	with national/EU legal and policy frameworks, where applicable.				
	MC for enabling green skills are recognised as having an impact on company and sectoral labour systems,	Companies (HR), career guidance and job placement centres	Identification of MC in curricula (long term) Suitability of MC descriptors for identifying emerging skills and skills gaps in companies	At ecosystem level (regional/national)	Vision 3 Micro-credentials meet the current skills needs
	Verify that the MCs for green skills can be integrated into skills qualification and certification systems	Policy makers responsible for training and employment	Verify the referencing of MCs to national, regional or EU certification frameworks	At ecosystem level (regional/national)	Vision 7 Micro-credentials recognition and integration into qualification systems
	Assess measurability, comparability, and quality achievement	Employer, association of companies, etc VET Coordinator	Conduct comprehensive stakeholder satisfaction surveys measuring delivery quality and learner experience Survey employer partners	At ecosystem level (regional/national)	Vision 1 Measurable comparable and understandable micro-credentials

			regarding participant skill application effectiveness in workplace contexts Implement external quality audit processes using international accreditation standards (WAM/EU Recommendation) and protocols		
	Measuring public support and system integration	Policy makers responsible for training and employment	Conduct public awareness surveys measuring perception changes and MC understanding levels Evaluate formal education system integration discussions through policy maker interviews and documentation review	Workplace and Industry settings (At company level) At ecosystem level (regional/national)	Vision 5 Create public support for micro-credentials

The MASTERY project, through the piloting of micro-credentials for green growth skills, aims to establish a robust evaluation system that validates the effectiveness, credibility, and market acceptance of micro-credential certifications. This comprehensive evaluation framework encompasses multiple dimensions that validate not only what participants learn, but also how their learning aligns with established standards, meets quality expectations, and achieves recognition in professional contexts.

The project implements a systematic approach to evaluate whether participants achieve clearly defined and standardized learning outcomes through validated

measurement tools referenced to specific learning objectives. These assessment instruments measure both knowledge acquisition and practical skill application, enabling comprehensive understanding of participant progress and program effectiveness. The evaluation methodology ensures that learning achievements are measurable against predetermined benchmarks and can be consistently validated across different delivery contexts (i.e. different companies in the Wood & Furniture sector, etc)

A fundamental objective involves establishing micro-credential comparability by benchmarking participant performance against established industry standards and recognized professional competency frameworks. The project supports comparative analysis between student learning outcomes and existing ESCO descriptors referenced to MASTERY learning outcomes, professional association requirements, and employer-defined competency expectations. This verification process ensures that micro-credential holders can demonstrate their qualifications relative to European competency referencing benchmarks, facilitating recognition and transferability across diverse organizations and sectors.

Beyond rigorous outcome evaluation, MASTERY incorporates systematic feedback collection from multiple stakeholder groups, including participants, employers, educational partners, and industry experts, to assess satisfaction regarding program quality, delivery methods, and outcomes. The evaluation examines whether quality assurance mechanisms successfully maintain consistent standards across different delivery contexts while meeting diverse stakeholder expectations (indeed, MASTERY pilots 12 skills in 5 country context, and 4 different industry and transversal sectors).

The project analyzes digital credential recognition rates and employer acceptance levels to determine real-world market validity. This involves monitoring how frequently employers engaged in the pilot programs recognize and value micro-credentials, including those developed outside the MASTERY framework, in hiring decisions, promotion considerations, and professional development planning. The analysis examines digital badge adoption rates, employer integration of micro-credentials into HR systems, and credential influence on workforce integration. This market acceptance evaluation provides crucial evidence of the practical value and sustainability of micro-credentials as professional development tools.

The evaluation results will inform training providers and stakeholders about micro-credentials' contribution to addressing current skills gaps in the green economy, while simultaneously strengthening confidence in their quality and relevance for future workforce development initiatives.

PHASE	WHAT	WHO	HOW	WHERE	VISION
ACT	Standardizing Quality and	Quality Assurance	Implement refined quality	At system level	Vision 1,

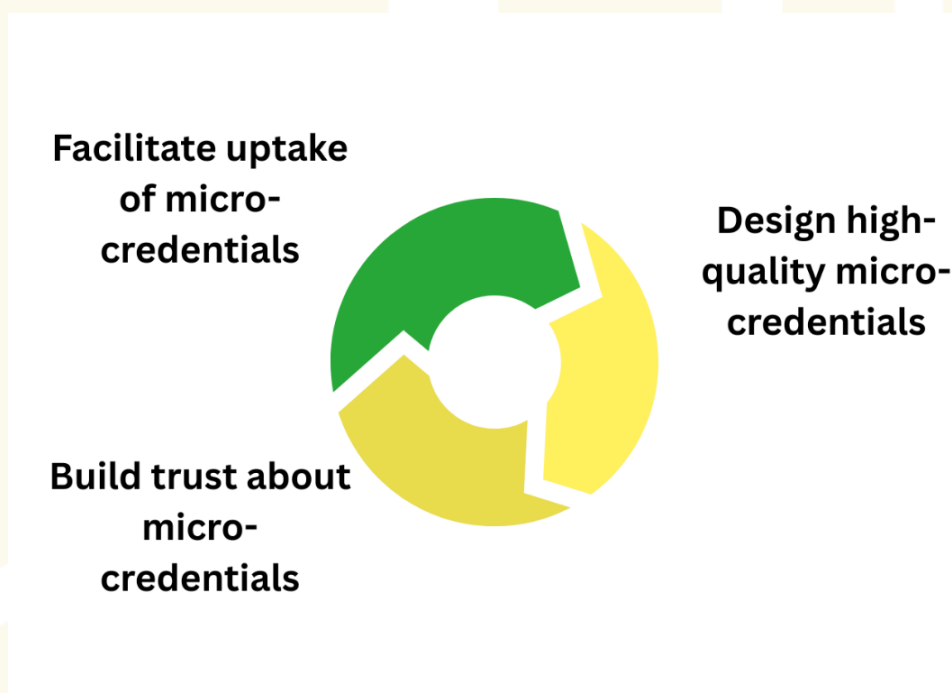
	recognition systems	for VET expert	assurance protocols based on pilot evaluation findings		Measurable comparable and understandable micro-credentials Vision 2: Fit-for-purpose quality assurance Vision 7 Micro-credentials recognition and integration into qualification systems
	Scaling current relevance and future adaptability	VET Manager and Coordinator	Implement adaptive curriculum management systems enabling rapid response to emerging skills needs	At VET provider level	Vision 3: Micro-credentials meet the current skills needs Vision 4: Micro-credentials anticipate future training needs
	Boosting Public support and Stakeholder Engagement for VET MCs	Employer, Industry cluster, association, Chamber of Commerce, Certification entities, University VET Coordinators, VET Association VET trainers and educators	Create systematic communication strategies maintaining public understanding of MC value and accessibility in VET system Develop policy advocacy initiatives supporting MC integration into lifelong learning	At system level	Vision 6: Raise awareness on micro-credentials as lifelong learning option Vision 7 Micro-credentials recognition and integration into qualification systems Vision 8: Involve wide range of

			and skills development frameworks		stakeholders in micro- credentials application
The transition from the MASTERY pilot case to a scalable educational infrastructure requires the systematic implementation of quality standards and recognition pathways that establish long-term credibility. Organisations participating in the MASTERY trial intend to structure quality assurance mechanisms that maintain consistency across different delivery contexts, while building employer trust through transparent and verifiable skills validation. According to the MASTERY working group, this strategic approach creates a sustainable competitive advantage in the rapidly expanding micro-credential market by establishing recognised standards that differentiate high-quality programmes from proliferating alternatives. The focus goes beyond the immediate delivery of programmes to include sustainable recognition systems that ensure micro-credentials retain their value over time, creating lasting institutional capacity for green skills development. Continuous adaptation systems are therefore essential to keep MASTERY aligned with the evolving needs of the sector, while anticipating the future requirements of the green economy. Organisations are committed to establishing dynamic feedback mechanisms that capture emerging skills needs, technological developments and regulatory changes that affect sustainability practices. This proactive approach positions institutions as leaders in sustainability education innovation, ensuring that micro-credential offerings remain at the forefront of industry transformation rather than reacting to market changes. Strategic implementation involves building organizational capacity for the continuous evolution of curricula, stakeholder engagement and the updating of competency frameworks that maintain long-term value for participants and stakeholders while responding to the accelerated pace of green transition requirements. Institutionalized stakeholder engagement and the creation of public support ensure resilient micro-credential ecosystems that transcend individual leadership changes, economic fluctuations and political shifts. This requires the creation of integrated partnerships with government agencies, industry associations, educational institutions and community organisations that create multi-level support systems for continued investment in sustainability skills development. The strategic framework emphasizes the creation of systemic integration rather than project-specific initiatives, ensuring that the availability of career paths for diverse populations becomes a permanent feature of the educational and employment landscape. The MASTERY working group believes that this approach can create a lasting institutional commitment to green skills					

development that survives organizational transitions and maintains momentum through changes in the political and economic context.

6 Conclusions and recommendations for the next cycle of experimentation

The MASTERY Policy Methodology was generally well perceived by the stakeholders who evaluated positively its visions and reasonable approach. However, the complexity of the micro-credentials roll-out and the evaluation collected on the importance and realistic implementation of actions in the short-term highlight that the MASTERY Policy Methodology has the potential to unfold next cycle of experimentation focused on holistic design and piloting of micro-credentials in key green economy sectors across the EU.



The outcomes of the 8 Policy Co-creation groups underpin the national specifics and diversity of the educational ecosystems based on the different levels of development. These range from Finland where advanced practices are in place and emphasis is on collaboration through Spain & Italy where the focus is on terminology unification and structural alignment to Bulgaria as the least developed system where prioritization of foundational policy frameworks is in demand. On EU level, the outcomes call for consistency, comparability, and cross-border recognition.

Even though the eight visions of micro-credentials were strongly validated by the stakeholders from five countries (Italy, Spain, Bulgaria, Finland, and Belgium - EU level), it is now apparent that the process of applying, developing and delivering micro-credentials is not straight-forward, but rather a cycle of continuous improvement starting with facilitating uptake of micro-credentials, going through design of high-quality micro-credentials and finally to building trust:

Figure 4: Iterative process of continuous improvement of applying, developing and delivering micro-credentials

The main findings from the Policy Co-creation groups identify the stakeholder priorities to focus on:

- Strong support for multi-stakeholder collaboration (policy, education, industry) and demand for unified terminology for micro-credentials.
- Need for common EU-aligned frameworks and quality standards.

The MASTERY Policy Methodology creates a solid basis for the next cycle of experimentation when MASTERY will enter into design and piloting of micro-credentials taking into account the holistic process developed in this document. During WP4, MASTERY will initiate a standardized micro-credential design via the development of 12 micro-credential courses on green skills using a unified format based on ESCO, EQF, EQAVET, the link to the EU Council Recommendation (June 2022) and interoperable metadata for digital badges. In this regard, MASTERY will test a digital Learning Management System to showcase how policy vision can be applied in practice in countries with different level of development. Additionally, MASTERY will roll out national pilots with coordinated support to ensure learner/employer feedback loops, stackability and recognition testing and varied delivery formats (online/blended/in-person).

For utilizing the proposed holistic approach in the MASTERY Policy Methodology, the process of stakeholder dialogue and awareness raising will be reinforced through the ongoing ecosystem activation and the signing of MoUs with key public and private actors in the different countries. This will serve as a solid basis for the successful implementation of Kick-start workshops and the roll out of the MASTERY Policy Recommendations in WP5.

Specifically on the Kick-start workshops, they will be instrumental to facilitate the dialogue between the stakeholders on policy recommendations implementation and sustainability plan for the design and implementation of micro-credentials. The Kick-start workshops will pilot the MASTERY paradigm of navigating multi-stakeholder and multi-disciplinary engagement for consolidating the micro-credential release experiences in Europe by formalizing groups with Policy makers, Educational providers, Industry, companies, business and Intermediary organizations (industrial chambers, confederations, employment agencies). Furthermore, it is recommended that the Kick-start workshops go beyond awareness raising on the MASTERY paradigm but also support the process of monitoring and evaluation of the micro-credentials application by initiating the dialogue on micro-credentials KPIs development.

As a result of this stakeholder engagement process, MASTERY will produce policy recommendations for VET and public authorities. Besides practical recommendations for VET adaptation to micro-credentials and promotion to industry, innovation agents, clusters, universities, etc. – it is suggested that the policy recommendations develop guidance on terminology unification by the creation of national glossaries with one standardized term per country. Additionally, the policy recommendations can incorporate country-specific briefs covering legal landscape, actor responsibilities and potential recognition pathways.

To facilitate this process in the best possible way, it is suggested that the pilots (WP4) and the strategic MASTERY activities (WP5) are actively promoted via communication and awareness campaigns focusing on info sessions and media outreach, testimonials from learners and companies and collaboration with ministries and public employment services.

The transition from methodological consensus on which this MASTERY Policy Methodology is focused to tested, recognized, and replicable micro-credential systems is a long-term and demanding process. The next cycle of experimentation with the suggested recommendations for MASTERY activities has the ambition and vision to roll out this process and to empower lifelong learning, meet green transition demands, and support embedding micro-credentials in European education and labor ecosystems to full extent.



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