RESkill 4NetZero
Boosting Green Energy Careers

RESkill4NetZero

EU Recognised Micro-Credentials and Certifications

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Executive Summary

The RESkill4NetZero project responds to the urgent need for a skilled and adaptable workforce to support Europe's transition to a climate-neutral economy. As technological, regulatory, and market conditions evolve rapidly in the renewable energy sector, traditional education and training systems alone are not sufficient to ensure continuous upskilling and reskilling. This deliverable presents a European-oriented micro-credential certification framework designed to complement existing qualifications by enabling flexible, modular, and competence-based recognition of skills.

The framework introduces a learning unit-based certification model aligned with the European Qualifications Framework (EQF), allowing for the granular validation of knowledge, skills, and competences acquired through short, targeted learning experiences. Each learning unit leads to a micro-credential, which serves as verifiable proof of competence. These micro-credentials can be accumulated into "stacks" representing broader capability areas and combined into structured "pathways" aligned with job roles in the renewable energy sector. This modular and stackable approach supports lifelong learning, career progression, and workforce mobility across Europe.

To ensure relevance to labour market needs and consistency with European standards, the framework is grounded in the skills intelligence developed in Work Package 2 and aligned with the ESCO (European Skills, Competences, Qualifications and Occupations) classification. This alignment enables a common language for skills and occupations, strengthening transparency and facilitating cross-border recognition by making competences comparable across Member States. In combination with EQF level referencing, this provides a robust foundation for interoperability between education and training systems and labour market actors.

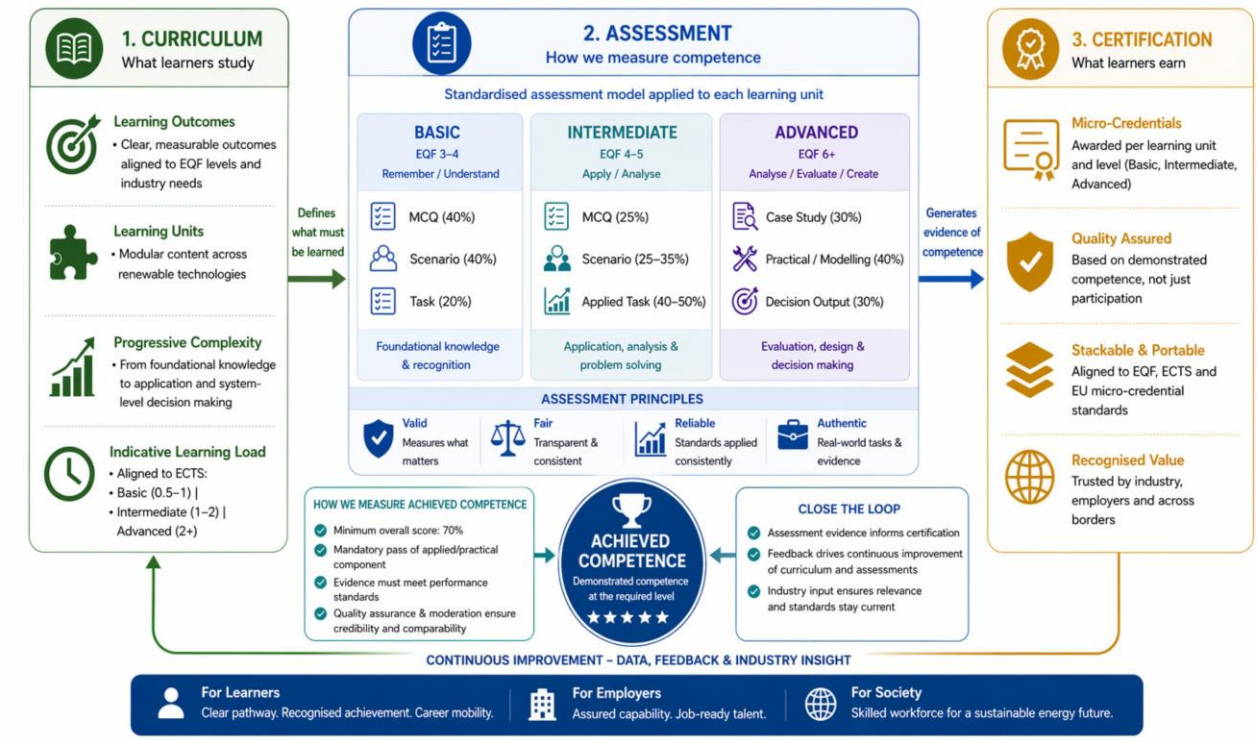
Certification is based on demonstrated competence rather than participation in training. Each learning unit is supported by a standardised assessment blueprint, combining knowledge checks, applied scenarios, and practical or performance-based tasks. Assessment methods and weighting are adapted to the level of complexity (Basic, Intermediate, Advanced) and aligned with Bloom's Taxonomy to ensure appropriate cognitive rigor. This ensures that micro-credentials reflect real-world capabilities and can be trusted by employers.

The framework is further aligned with the European Council Recommendation on micro-credentials (2022), incorporating key principles such as transparency, quality, stackability, and portability. It is designed to be compatible with emerging European digital credential infrastructures, enabling secure, verifiable, and shareable certification formats that support learner mobility and recognition across borders.

Importantly, the RESkill4NetZero certification framework does not replace national

qualifications or sector-specific certifications. Instead, it provides a complementary European layer that enhances flexibility, supports reskilling pathways, and improves the visibility of competences in the renewable energy workforce.

By establishing a coherent, modular, and interoperable certification approach, this framework contributes to the development of a common European skills space for the green transition. It supports learners in building and demonstrating relevant competences, enables training providers to align with European standards, and helps employers better identify and trust workforce capabilities across the renewable energy ecosystem.



RESKILL4NETZERO CERTIFICATION FRAMEWORK

1. Introduction

The transition to a climate-neutral economy requires a highly skilled and adaptable workforce capable of responding to rapid technological, regulatory, and market changes in the renewable energy sector. The Micro-Credential Certification Framework for the Renewable Energy Core VET Curriculum has therefore been developed as a complementary European instrument to support continuous upskilling and reskilling throughout working life. It does not replace or duplicate existing national education and training systems, nor does it substitute full qualifications. Instead, it provides a modular, flexible, and competence-based layer of recognition that builds upon initial education and formal qualifications.

By introducing a shared micro-credential architecture aligned with the European Qualifications Framework (EQF), it enables the granular recognition of competences acquired through short, targeted learning experiences. These competences can be accumulated, combined, and transferred across borders, supporting both learner mobility and workforce adaptability within the European Union.

In this way, the RESkill4NetZero certification framework contributes to the creation of a common European reference space for renewable energy skills, strengthening transparency, comparability, and trust while respecting the diversity and sovereignty of national education and training systems.

2. Purpose and Context

The RESkill4NetZero Work Package (WP) 3 D3.1 “Renewable Energy Core VET Curriculum” report defines four primary purposes of the Core Curriculum:

- To establish a shared European reference framework for renewable energy competences, aligned with the European Qualifications Framework (EQF).
- To support upskilling and reskilling pathways for workers transitioning from adjacent sectors (e.g. construction, fossil energy, and manufacturing).
- To enable modular, stackable, and micro-credential-based learning that supports lifelong learning and cross-border recognition.
- To strengthen alignment between industry demand and training provision, ensuring responsiveness to technological and regulatory developments.

This document focuses on the third objective and sets out the RESkill4NetZero credentialing and certification framework. The aim is to operationalise a micro-credential approach that delivers recognised, portable, and labour-market-relevant proof of competence.

The proposed Micro-Credential Certification Framework for the Renewable Energy Core VET Curriculum is based on a micro-credential certification model with the following characteristics:

- Certification is awarded at the level of defined learning units, enabling granular recognition of

skills.

- Certification is independent of training delivery, allowing multiple providers to contribute to the ecosystem
- Learning pathways are modular and stackable, supporting flexible progression aligned to job roles
- Credentials are designed to support cross-border recognition and workforce mobility within Europe

Rather than defining rigid, occupation-specific certifications, this approach establishes a skills-based certification architecture. This ensures the framework remains adaptable to evolving workforce requirements in the European renewable energy sector while maintaining consistency, transparency, and comparability across contexts.

3. Methodology and design

The development of the WP3 curriculum and associated certification framework is grounded in the findings of WP2, which identified priority job roles and the corresponding knowledge, skills, and competences required to support the growth of a renewable energy workforce aligned with Europe's Net Zero objectives.

WP2 analysis also highlighted the importance of skills portability and workforce mobility across Member States. This creates a need for a common reference approach that supports cross-border recognition, while remaining compatible with national certification systems and regulatory requirements.

To ensure alignment with European labour market intelligence and enable cross-border comparability, the RESkill4NetZero framework is anchored in the ESCO (European Skills, Competences, Qualifications and Occupations) classification. Learning outcomes and competence definitions are mapped to ESCO skills and occupations identified in WP2, ensuring consistency between curriculum design, certification, and labour market needs.

In this context, the RESkill4NetZero certification framework is designed to provide recognised and transferable proof of competence for employers and labour market actors. It is important to note that this framework is not intended to replace existing industry-specific or regulatory certifications. Instead, it establishes a complementary standard, defining the level of proficiency expected for key roles within the renewable energy value chain. While the RESkill4NetZero framework is not intended to function as a formal European qualification system in itself, it is designed to facilitate comparability, transparency, and interoperability across Member States. Formal recognition and endorsement would depend on implementation pathways at national and sectoral level, including adoption by VET providers, sectoral skills partnerships, competent authorities, and industry stakeholders.

Potential implementation mechanisms may include alignment with National Qualification Frameworks (NQFs), integration into Europass Digital Credentials Infrastructure (EDCI), sectoral recognition agreements, and incorporation into accredited continuing vocational education and training programmes. In this sense, the framework provides a common reference architecture that can support future recognition processes while remaining compatible with national regulatory systems.

3.1. ESCO alignment, skills taxonomy and other EU frameworks

To ensure semantic interoperability and comparability across European labour market and education systems, the RESkill4NetZero certification framework adopts ESCO (European Skills, Competences, Qualifications and Occupations) as the primary reference taxonomy for skills and occupational alignment.

ESCO descriptors identified in WP2 were used to:

- define learning outcomes,
- structure competence areas,
- align occupational pathways,
- support stackable micro-credential architecture,
- and facilitate future digital credential interoperability.

This approach enables consistent interpretation of competences across Member States and supports alignment with Europass, EDCI, and emerging Open Badge ecosystems. In the following table, we can see how the RESkill4NetZero framework aligns with the different European Frameworks and Digital Credential Standards:

Instrument	Role in framework
EQF	Defines level and complexity
ESCO	Provides skills and occupational taxonomy
ECTS/ECVET principles	Supports workload estimation and portability
Europass	Supports credential visibility and portability
EDCI	Enables digital verification and authentication
Council Recommendation (2022)	Provides policy principles for micro-credentials
Open Badges	Open Badges

3.2. EU recommendations on the use of micro-credentials and peer learning activities within the Pact for Skills community

In order to provide recommendations on the use of micro-credentials, EUREC (task leader and coordinator of the large-scale partnership on renewable energy skills) participated in the peer-learning activity organised by the European Commission on 26 March 2025[1] . Practical example presentations and breakout room discussions allowed participants to deepen their knowledge on the topic and reflect on the benefits and challenges of using micro-credentials to support upskilling and reskilling in their industry ecosystems. Main conclusions of this activity as well as recommendations from the Council published in 2022[2] will be used here as a basis of creation of micro-credentials for the RESKill4NetZero certification framework. Key conclusions emerging from the Pact for Skills peer-learning activity included:

- The importance of employer involvement in the design and validation of micro-credentials
- The need for transparent learning outcomes aligned with EQF and labour market needs
- The value of stackable and modular learning pathways for workforce reskilling
- The importance of interoperable digital credentials to support portability across borders
- The need for quality assurance mechanisms to build trust among employers and education providers
- Recognition that micro-credentials are particularly effective for rapidly evolving sectors such as renewable energy

The 10 European principles for Micro-Credentials outlined in the Council Recommendation aim to ensure trust, transparency, and portability:

1. Quality: must meet the provider's quality assurance standards

2. Transparency: clearly describe learning outcomes, workload (e.g. in hours/ECTS), level (EQF), and assessment methods.

3. Relevance: aligned to labour market and societal needs, supporting upskilling/reskilling for employability and lifelong learning.

4. Validity: based on formal, transparent learning outcomes and quality-assured assessment.

5. Portability: recognised across institutions and borders; digitally shareable and stackable (e.g. in Europass).

6. Stackability: designed so they can be combined towards larger qualifications.

[1] Organised under the European Commission's Pact for Skills, this online event gathered Pact members—public, private, educational stakeholders—to exchange on using micro credentials for upskilling/reskilling in response to labour shortages b781d4cb-15c2-492a-a21e-d78695b04037_en

[2] Council Recommendation on a European approach to micro-credentials for lifelong learning and employability (2022/C 243/02).

7. Recognition: should be recognised by employers, institutions, and authorities—formally and informally.

8. Authentication: issued securely and verifiably using digital infrastructure.

9. Inclusiveness: accessible to all learners—regardless of background or status—supporting social equity.

10. Learner-centred: allow flexibility in pace, time, and location; empower learners to own and use their credentials.

3.3. Curriculum structure and design logic

The Renewable Energy Skills Core VET Curriculum developed under WP3 is structured as a modular learning framework, organised into modules, which are further broken into learning units. Each learning unit is:

- Defined by specific learning outcomes
- Aligned to European Qualifications Framework (EQF) levels
- Mapped to the knowledge, skills, and competences required at three progression levels: Basic, Intermediate, and Advanced

This structure provides clarity on what learners need to know and should be able to do. However, the curriculum alone does not define how competence is formally demonstrated or recognised. At the same time, existing certification approaches were found to have several limitations:

- Certifications are typically programme-based rather than modular
- They are closely tied to specific training providers or delivery formats
- They offer limited flexibility across roles, sectors, and national contexts
- They do not sufficiently support lifelong learning or reskilling pathways

The RESkill4NetZero certification framework addresses these gaps by introducing a learning unit-based micro-credential model, directly linked to demonstrated competence.

Certification Framework Design Principles

The certification framework is based on five core design principles:

Learning Unit-Based Certification (Not Job-Based)

Certification is issued at the level of individual learning units, with each unit corresponding to a micro-credential. This approach avoids the need to create a large number of job-specific certifications and enables flexibility across roles, sectors, and countries. While the framework avoids rigid occupation-

specific certifications, predefined pathway combinations are proposed to support alignment with common renewable energy occupational profiles identified in WP2. These pathways are indicative and flexible rather than mandatory professional licences.

Assessment-Based and Independent of Training Delivery

Certification is awarded based on successful completion of defined assessments, regardless of how or where learning has taken place. Assessment blueprints are developed at the learning unit level to ensure consistency and validity in evaluating competence.

Competence-Based and Aligned to Learning Outcomes

Certification validates demonstrated performance rather than participation.

All assessments are directly aligned to:

- Defined learning outcomes
- Performance expectations
- EQF levels

Stackable and Composable Structure

Micro-credentials can be combined to form learning pathways aligned to job roles or sector needs. They can also be accumulated over time, supporting continuous professional development and reskilling.

Interoperability Across European Contexts

The framework is designed to support:

- Cross-border recognition of skills
- Alignment with EQF and emerging European micro-credential standards
- Adaptation to national and sector-specific requirements

This methodology ensures that the certification framework is flexible, scalable, and aligned with labour market needs, while maintaining a consistent and transparent approach to competence recognition across the European renewable energy ecosystem. The framework is also designed to be compatible with the Europass Digital Credentials Infrastructure (EDCI), enabling secure, verifiable, and portable digital credentials. Emerging initiatives such as Open Educational Badges aligned with ESCO demonstrate the feasibility of competence-based, digitally verifiable micro-credentials and may inform future implementation phases.

Example - European Implementation Scenario

A renewable energy training provider in Spain delivers a Wind Energy Operations learning unit aligned with the RESkill4NetZero framework. The learning outcomes, assessment blueprint, EQF level, and ESCO references follow the common European framework defined in WP3.

Upon successful completion, learners receive a digital micro-credential issued through Europass-compatible infrastructure and linked to EDCI standards. An employer in Denmark reviewing the credential can interpret the learner's competence level using the shared EQF and ESCO references.

Over time, additional learning units completed in other Member States can be accumulated into broader competency stacks and role-based pathways, supporting workforce mobility and lifelong learning across the European renewable energy sector.

4. Certification model overview

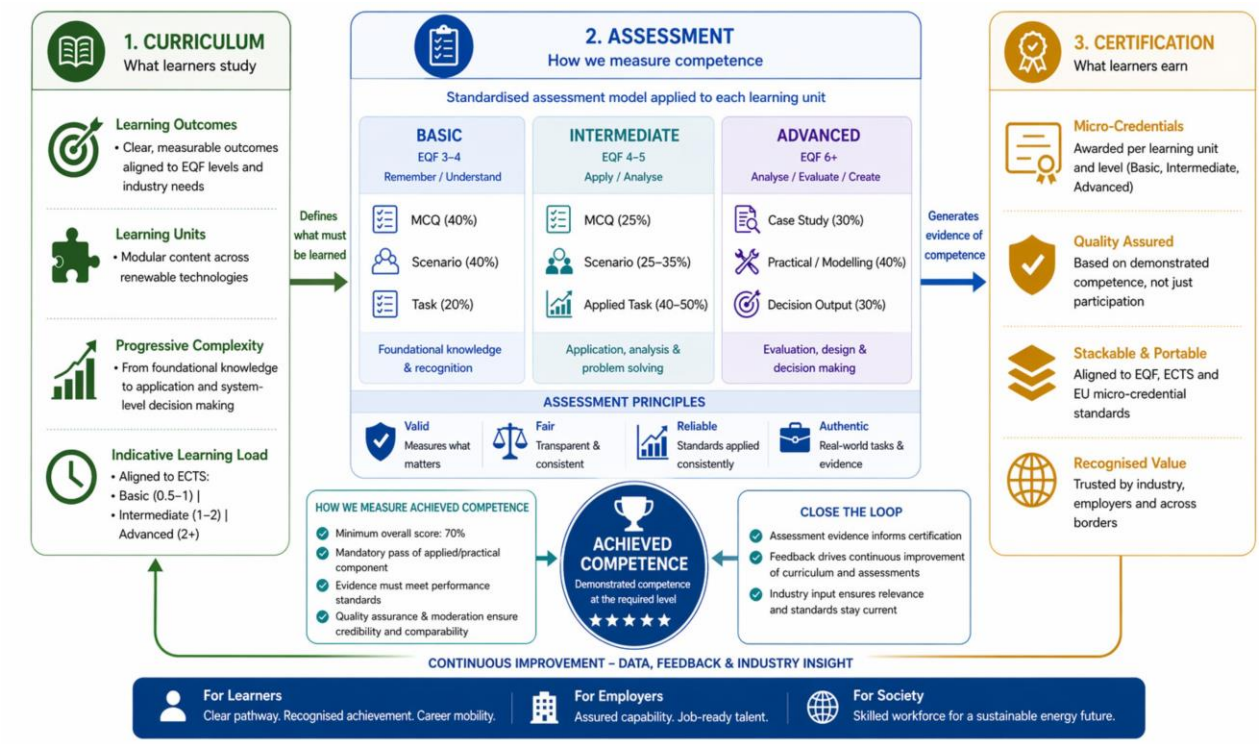


Table 1: RESkill4NetZero certification framework overview

The RESkill4NetZero certification model is structured as a multi-level architecture that enables granular recognition of skills while supporting progression toward job-role competence. The model is designed to balance flexibility (at the learning unit level) with coherence (at the pathway level).

At its core, the model defines four interconnected levels of certification:

LEVEL	DEFINITION

LEARNING UNIT	The smallest certifiable component, representing a defined set of learning outcomes (e.g. "3.2 Wind Energy")
MICRO-CREDENTIAL	Awarded upon successful completion of a learning unit assessment
STACK	A group of related learning units forming a recognised capability or competency area
PATHWAY	A structured combination of stacks aligned to a specific job role

Table 2: RESkill4NetZero levels of certification

Each learning unit offers the opportunity to earn a micro-credential, which serves as verifiable proof of competence in a specific area. These micro-credentials can be accumulated and combined into stacks, which represent broader capabilities. Stacks can then be assembled into pathways aligned to job roles within the renewable energy sector.

This structure enables learners to progress incrementally, while allowing employers to interpret and recognise competence at different levels of granularity.

Example:

The following example demonstrates how individual learning units combine into a job-role pathway:

Wind Turbine Technician Pathway

- 3.2 Wind Energy (Intermediate)
- 7.1 Operations & Maintenance Protocols (Intermediate)
- 5.1 Power Systems (Basic)
- 8.1 Workplace Safety (Intermediate)

→ Stack: Wind Operations Competency

→ Pathway: Wind Turbine Technician

This example illustrates how discrete, certifiable skills can be combined into meaningful, job-relevant competence profiles

5. Assessment Blueprint

To ensure consistency and credibility, each learning unit is supported by an assessment blueprint. Learning objectives specify the required knowledge and skills for competence. The assessment blueprint outlines how to measure mastery of these objectives. The assessment blueprint defines how

competence is evaluated and ensures alignment across providers and contexts.

What is Assessed

Assessment is directly mapped to:

- Defined learning outcomes
- Performance standards aligned to EQF levels (Basic, Intermediate, Advanced)

This ensures that certification reflects demonstrated competence, rather than completion of training.

How Competence is Assessed

A combination of assessment methods is used to evaluate different dimensions of competence:

Assessment Type	Purpose
Knowledge Check (MCQ)	Assess conceptual understanding
Applied Scenario / Case	Assess decision-making and problem-solving
Practical Demonstration	Assess hands-on technical competence
Project / Assignment	Assess integration and application of skills
Observed Task	Validate real-world performance

Table 3: RESkill4NetZero assessment types

This multi-method approach ensures that both theoretical knowledge and applied skills are appropriately evaluated.

Assessment Weighting (Indicative Model)

Assessment components are weighted to reflect the importance of applied competence. An example is below, but it will vary depending on level.

Component	Indicative Weighting
Knowledge (MCQ)	20–30%
Applied Scenario	20–30%
Practical / Observed Task	30–50%
Project (if applicable)	Optional (primarily at advanced levels)

Table 4: RESkill4NetZero assessment weighting

The weighting model prioritises practical and performance-based assessment, ensuring alignment with real-world job requirements.

Overall, this certification model provides a transparent, modular, and competence-driven approach to recognising skills. It enables learners to build credentials progressively, while ensuring that employers

can trust the validity and relevance of certified competences across different roles and European contexts.

5.1 Assessment by Level

Assessment blueprints must detail two levels:

- Appropriate reading comprehension and foundational level required to obtain a valid measure
- Appropriate rigor required for Basic, Intermediate or Advanced level of the learning unit

To effectively measure the acquisition of knowledge and skills, assessments must not impose artificial barriers that prevent the accurate results. An assessment blueprint will consider the foundational knowledge required for each unit and include the reading comprehension level appropriate for the EQF level.

Additionally, the blueprint considers the Bloom's Taxonomy level and suggests the most appropriate methods for the Bloom's level. This ensures appropriate rigor to accurately gauge competence against the objectives of each learning unit.

Basic Level (Awareness & Understanding)

Focus: Knowledge + simple application

- Multiple Choice Questions (MCQs)
- Short applied scenarios
- Simple observed tasks

✓ Example: Identify components, explain concepts

Intermediate Level (Application & Analysis)

Focus: Practical competence

- Scenario-based assessments
- Simulated or real tasks
- Data interpretation

✓ Example: Diagnose issue, apply tools

Advanced Level (Evaluation & Design)

Focus: System thinking & decision-making

- Case studies
- Projects
- Design or optimisation tasks

✓ Example: Evaluate system, propose solution

5.2 Integrated Assessment & Certification Framework

Assessment across all modules is designed using a standardised, learning unit-based model aligned with EQF levels and Bloom's Taxonomy. Each level applies a consistent mix of assessment methods, with increasing emphasis on applied and performance-based evaluation. At Basic level, assessment focuses on knowledge and recognition; at Intermediate level, on application and analysis in realistic technical scenarios; and at Advanced level, on system-level evaluation, design, and decision-making.

All learning units follow this structure, with assessment components tailored to the specific technology while maintaining consistent weighting and performance expectations. This ensures comparability across technologies while allowing for contextualised, job-relevant competence validation.

Sample Module 3 Assessment and Certification Framework:

Level	EQF	Bloom's Level	Workload (ECTS)	Learning Focus	Assessment Model	Certification Outcome
Basic	EQF 3–4	Remember / Understand / Apply	15–30 hrs (0.5–1 ECTS)	Foundations of renewable technologies; recognition of systems and principles	MCQ (40%); Scenario (40%); Task (20%)	Demonstrates foundational knowledge and ability to identify technologies and applications
Intermediate	EQF 4–5	Apply / Analyse	30–60 hrs (1–2 ECTS)	Applied technical competence; system operation and performance analysis	MCQ (25%); Scenario (25–35%); Applied Task (40–50%)	Demonstrates ability to apply knowledge, interpret data, and solve technical problems
Advanced	EQF 6+	Analyse / Evaluate / Create	60+ hrs (2+ ECTS)	System-level evaluation; integration, optimisation, and design	Case Study (30%); Practical (40%); Decision Output (30%)	Demonstrates ability to evaluate systems, design solutions, and justify decisions in real-world contexts

Table 5: *Sample Module 3 Assessment and Certification Framework*

The framework is designed to ensure alignment across four key dimensions:

- Workload (ECTS): Reflects the total effort required to achieve competence, including learning, practice, and assessment
- EQF Level: Defines the expected level of autonomy, responsibility, and technical complexity
- Cognitive Rigor (Bloom's Taxonomy): Ensures increasing depth of understanding and capability
- Assessment Method: Validates competence through progressively more applied and performance-based evaluation

Progression Model

- At Basic level, learners demonstrate understanding and recognition of renewable energy systems
- At Intermediate level, learners apply knowledge to analyse performance and solve technical problems
- At Advanced level, learners evaluate complex systems and design optimised solutions

This progression ensures that micro-credentials represent real, verifiable competence aligned to labour market expectations, rather than completion of learning activities.

Certification Integrity

This integrated model ensures that:

- Micro-credentials are workload-based and EQF-aligned
- Assessment reflects increasing cognitive and technical complexity
- Certification is based on demonstrated performance
- Credentials are transparent, comparable, and transferable across contexts

The following example illustrates how a standardised assessment blueprint is applied at the level of an individual learning unit. This ensures consistency in how competence is evaluated, regardless of training provider or delivery format.

5.3. Sample Blueprint: Learning Unit 3.2 – Wind Energy (Intermediate)

Learners are assessed through a combination of knowledge checks (25%), scenario-based application (25%), and applied data interpretation tasks (50%), requiring them to explain turbine operation, interpret wind resource data, and analyse system performance in realistic conditions. Certification is awarded upon achieving a minimum score of 70%, with a mandatory pass of the applied component, ensuring validation of practical competence aligned to EQF Level 4–5.

Certification Title

Wind Energy Systems – Intermediate Micro-Credential

Competence Scope

- Turbine components and system architecture
- Mechanical and electrical operation
- Wind resource interpretation

Assessment Blueprint

Component	Method	Description	Weight
Knowledge	MCQ	Assessment of core concepts, including turbine components, aerodynamics, and system terminology	25%
Application	Scenario-based task	Explanation of turbine operation in a real-world scenario (e.g. response to changing wind conditions)	25%
Practical	Applied task / data interpretation	Interpretation of wind resource data and basic system performance indicators	50%

Table 6: Assessment Blueprint

Performance Standard

Learners must demonstrate the ability to:

- Explain how wind energy is converted into electricity through mechanical and electrical processes
- Interpret wind resource data and its impact on system performance
- Apply technical knowledge to analyse system behaviour in realistic operating conditions

Pass Criteria

Minimum overall score: 70%

Mandatory pass of applied/practical component

Alignment to Framework

EQF Level: 4–5

Bloom's Taxonomy: Apply / Analyse

Workload: 30–60 hours (≈1–2 ECTS)

6. Certification output

The certification output defines the information structure and metadata associated with each issued micro-credential. Its purpose is to ensure that credentials are transparent, verifiable, portable, and understandable across institutions, employers, and Member States.

Each micro-credential issued within the RESkill4NetZero framework is designed to include

standardised information aligned with European micro-credential principles and digital credential practices. This enables learners, employers, and training providers to clearly understand the scope, level, and evidence of competence associated with the credential.

Each micro-credential includes:

- Learning Unit name
- EQF level
- Competence description
- Assessment type
- Issuing body
- Verification (digital badge / certificate)

The framework supports comparability and transparency rather than automatic legal recognition.

6.1. Stacking Logic

A core feature of the RESkill4NetZero certification framework is the ability to combine micro-credentials in a structured way to reflect different types of competence development. This "stacking logic" enables both flexibility for learners and clarity for employers, supporting progression across roles, sectors, and levels of expertise. Pathways may combine multiple micro-credentials across EQF levels depending on occupational complexity and prior learner experience. The total cumulative workload of a pathway is therefore variable and adaptable to individual progression needs.
Micro-credentials can be combined in three primary ways:

A. Horizontal Stacks (Cross-Domain Competence)

Horizontal stacking combines learning units across different subject areas or modules at a similar EQF level.

- Enables development of complementary skill sets (e.g. technical, digital, safety, and regulatory knowledge)
- Reflects the interdisciplinary nature of many renewable energy roles
- Supports workforce adaptability across functions and sectors

Example: Combining learning units in digital systems, workplace safety, and regulatory policy to form a cross-functional competency profile.

B. Vertical Stacks (Progression Across Levels)

Vertical stacking represents progression in complexity and responsibility within the same competence area.

- Structured across EQF-aligned levels: Basic → Intermediate → Advanced
- Supports clear upskilling and reskilling pathways

- Enables recognition of increasing depth of expertise over time

Example: Advancing from basic understanding of power systems to intermediate application and advanced system optimisation

C. Role-Based Pathways (Occupational Alignment)

Role-based pathways are predefined combinations of micro-credentials and stacks aligned to specific job roles.

- Translate individual skills into job-relevant competence profiles
- Provide guidance to learners on how to progress toward specific occupations
- Enable employers to interpret and validate candidate readiness for roles

Example: A Wind Turbine Technician pathway combining technical, operational, and safety-related learning units.

6.2. Guidelines for the delivery of micro-credentials

In the European education and training system, credits are not assigned based on course content but on the total learner workload required to achieve defined learning outcomes. This principle underpins both the European Credit Transfer and Accumulation System and the European Credit system for Vocational Education and Training. Importantly, workload goes beyond formal teaching hours and includes all learning activities necessary to acquire the targeted competences: contact learning (such as lectures, workshops, laboratories, and practical training), autonomous learning (including reading, exercises, and online modules), and assessment (such as exams, projects, or practical demonstrations).

The standard conversion rule establishes that 1 ECTS corresponds to approximately 25–30 hours of total workload. To calculate the size of a micro-credential, the process therefore begins with clearly defined learning outcomes—for example, "operate and monitor a wind turbine system." Based on these outcomes, the required learning activities are identified and their associated workload estimated. A typical example at basic level might include 10 hours of lectures, 8 hours of practical exercises, 7 hours of self-study, and 5 hours of assessment, resulting in a total workload of 30 hours. This corresponds to approximately 1 ECTS, which can then be awarded as a micro-credential.

To ensure quality and recognition, micro-credentials must follow three key principles: they should be coherent, meaning they cover a complete and meaningful competence rather than a fragmented skill; assessable, with clear and appropriate evaluation methods; and workload-based, typically representing between 15 and 30 hours of learning (equivalent to approximately 0.5 to 1 ECTS).

6.3. Benefits

The RESkill4NetZero certification framework is designed to deliver value across key stakeholder groups, supporting both individual progression and broader labour market objectives.

For Learners

- Enables flexible, modular progression through micro-credentials that can be accumulated over time

- Supports recognition of prior learning and existing competences
- Facilitates career mobility across roles, sectors, and European labour markets

For Training Providers

- Provides clear, outcome-based standards without prescribing specific content or delivery methods
- Simplifies alignment with European frameworks, including EQF and emerging micro-credential standards
- Accelerates programme development through the use of defined learning units and assessment blueprints

For Industry and Employers

- Offers transparent and comparable validation of skills and competences
- Improves workforce matching by linking credentials directly to job-relevant capabilities
- Reduces retraining requirements by ensuring baseline competence is consistently defined and assessed

For Policymakers

- Establishes a scalable and transferable certification model across sectors and Member States
- Supports European priorities related to skills development, workforce mobility, and lifelong learning
- Reduces fragmentation by promoting a common approach to competence recognition

7. Implementation Considerations

To ensure effective and consistent implementation across contexts, several key considerations must be addressed:

- Definition of minimum assessment requirements
- Establish clear baseline criteria for each learning unit to ensure consistency in certification outcomes
- Separation of delivery and assessment standards
- Allow flexibility in how training is delivered, while maintaining standardised assessment requirements to ensure comparability
- Provision of supporting assessment resources

To support adoption by training providers, the framework should include:

- Assessment templates
- Sample assessment items
- Rubrics for evaluating practical and performance-based tasks
- Quality assurance and moderation processes
- Implement mechanisms to ensure the reliability and validity of assessments across providers, including moderation, review, and continuous improvement processes.

Examples:

Example 1: Learning Unit 3.2 – Wind Energy (Intermediate)

Certification Title

Wind Energy Systems – Intermediate Micro-Credential

Competence Scope

- Turbine components and operation
- Mechanical & electrical systems
- Diagnostics and fault identification

Assessment Blueprint:

Component	Method	Description	Weight
Knowledge	MCQ	Components, principles, terminology	25%
Application	Scenario	Diagnose turbine issue from case	25%
Practical	Simulation / SCADA	Interpret operational data	30%

Table 7: Assessment Blueprint Learning Unit 3.2 – Wind Energy (Intermediate)

Performance Standard

- Diagnose common turbine faults
- Interpret SCADA data correctly
- Recommend appropriate interventions

Pass Criteria

≥70% overall

Must pass practical component

Example 2: Learning Unit 4.2 – Battery Energy Storage Systems (Intermediate)

Certification Title

Battery Systems Assembly & Diagnostics – Intermediate Micro-Credential

Competence Scope

- Battery module assembly
- Safety procedures
- Performance testing and diagnostics

Assessment Blueprint

Component	Method	Description	Weight
Knowledge	MCQ	Battery types, safety risks	20%
Application	Case	Select correct battery configuration	20%
Practical	Observed Task	Assemble/test module	40%
Analysis	Data	Evaluate performance data	20%

	interpretation

Table 8: Assessment Blueprint Learning Unit 4.2 – Battery Energy Storage Systems (Intermediate)

Performance Standard

- Safely assemble battery modules
- Conduct testing and interpret results
- Identify faults and risks

Pass Criteria

Practical component mandatory pass

≥70% total

Example 3: Learning Unit 2.3 – Regulation & Permitting (Advanced)

Certification Title

Renewable Energy Permitting & Regulatory Strategy – Advanced Micro-Credential

Competence Scope

- EU regulatory frameworks
- Permitting processes
- Risk and barrier analysis

Assessment Blueprint

Component	Method	Description	Weight
Knowledge	MCQ	EU frameworks, terminology	15%
Application	Case study	Analyse permitting scenario	35%
Strategy	Written / report	Propose regulatory solution	30%
Evaluation	Oral / presentation	Defend recommendations	20%

Table 9: Assessment Blueprint Learning Unit 2.3 – Regulation & Permitting (Advanced)

Performance Standard

- Analyse regulatory barriers
- Propose viable permitting strategies
- Justify decisions with policy + technical context

Pass Criteria

≥70%

Must pass case + strategy components

8. Conclusion

The Micro-Credential Certification Framework developed under REDSkill4NetZero WP3 represents a

strategic step toward a more agile, responsive, and integrated European skills ecosystem for the renewable energy sector. By focusing on learning-unit-level certification, stackable credentials, and EQF-aligned competence recognition, the framework enables a more dynamic approach to lifelong learning and workforce development.

Through its modular design and shared European principles for micro-credentials, the framework strengthens the connection between education and the labour market while ensuring that learning outcomes remain transparent, portable, and comparable across Member States. It supports the evolving needs of employers and learners alike, without undermining the role of established education and training pathways. Implementation of the framework remains subject to applicable national regulatory and accreditation requirements. RESkill4NetZero micro-credentials complement existing qualification systems and do not replace legally regulated professional certifications where these are required.

Ultimately, the RESkill4NetZero certification framework provides a concrete, scalable model for implementing micro-credentials in the renewable energy sector and can serve as a reference for other industrial ecosystems supporting Europe's green transition