Accredited B4C Courses

Deliverable 5.2

Co-funded by the European Union

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This report has been created as a part of the project B4C

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1. Executive Summary

Executive Summary

This deliverable presents the portfolio of accredited courses developed within the Erasmus+ B4C (Biochar and Circular Carbon Economy) project. Building on the project's competence framework, learning platform and pedagogical approach, the consortium designed, piloted and quality-assessed a comprehensive set of learning opportunities covering vocational education, professional development and international mobility.

The course portfolio comprises **six accredited courses for VET learners** (EQF levels 2–4), addressing biochar applications in construction, horticulture, agriculture, climate farming and Circular Carbon Economy, together with **two advanced professional development programmes**: the Continuing Professional Development (CPD) course for VET trainers and the Carbon Manager Course. These programmes extend the B4C methodology to EQF levels 5–6 by preparing educators to deliver competence-oriented biochar education and professionals to design and implement regional Circular Carbon Economy initiatives.

All courses follow a shared educational philosophy based on Competence-Oriented Learning and Validation (COL&V), Design-Based Collaborative Learning, Design Thinking and the LEVEL5 competence model. Rather than focusing solely on technical knowledge, the programmes combine practical experimentation, collaborative project work and authentic sustainability challenges to foster both domain-specific and transversal competences, including systems thinking, innovation, teamwork and entrepreneurial action.

To ensure educational quality and transferability, every course underwent a structured assessment using the B4C Quality Framework, which combines ten general competence-oriented quality criteria with seven specific educational quality indicators. Only courses meeting the required standards received the B4C Quality Label and are included in this repository.

An important outcome of the project was the transfer of these courses into the **Erasmus+ KA1 Education mobility programme**. Based on the experience gained with the VET learner courses and the two professional programmes, the consortium developed **four international KA1 courses**, making the B4C methodology accessible to educators, trainers and professionals from across Europe through structured learning mobility. This establishes a coherent lifelong learning pathway that ranges from vocational learners to trainers, Carbon Managers and international professional development.

Overall, the accredited courses demonstrate that biochar and Circular Carbon Economy can be successfully integrated into vocational education and lifelong learning through competence-oriented, challenge-based and practice-oriented methodologies. Together, they provide a transferable European curriculum that supports the green transition by developing the competences needed to implement climate-positive biochar solutions across agriculture, construction, horticulture and regional development.

2. Introduction

The B4C project was established to bridge gaps in sustainability education across various levels and sectors of education—primarily focusing on Vocational Education and Training (VET).
At its core, B4C combines the teaching and implementation of biochar based Circular Carbon Economy with design thinking, collaborative, constructive and competence-based learning, and eventually validation. The overarching goal is to develop not only technical understanding of biochar production and application, but also transfer these competences in concrete learning projects which also includes the acquisition of transversal competences such as critical thinking, collaboration, empathy, and entrepreneurial spirit.
Quality criteria which are based on the Göttingen Catalogue of Didactic models and the works and quality approach developed by the REVEAL association in the framework of an Erasmus funded project on educational quality in competence-oriented learning and validation.
Competence-oriented learning (COL) is an **innovative movement in education** that emerged in the 1970s and evolved into fields of practice and study. The term refers generally to activities that either **enhance learning opportunities within formal education systems** or broaden **learning opportunities beyond formal education systems**.

COL involves but is not limited to: classroom teaching methods, approaches to **interactive learning**, formats in **work-related education** and training, the **cultures and ecologies of learning communities**, and the development and use of open educational resources.

While there is no agreed-upon, comprehensive definition of competence-oriented learning, central focus is commonly placed on the **needs of the learner as perceived by the learner**. Competence Oriented (Open) learning aims at **innovation both within and across (**academic) **disciplines**, professions, social sectors and national boundaries, and in business and industry, higher education institutions, collaborative initiatives between institutions, and schooling for young learners.

2.1. Quality Approach

The basic quality criteria for the B4C quality labelled course are thus the following:
B4C quality courses should:

1. Have a **competence-oriented** approach
2. Reach out **beyond formal** (in this case e.g. curricular) education
3. Promote a learning culture, learning communities via **Collaborative Learning**
4. Be **Needs Driven** (learner oriented)
5. Promote **Constructive** learning
6. Foster **Innovation and creativity**
7. Promote **Interdisciplinary** (intersectoral) learning
8. Promote **Interactive** learning
9. Offer a **blended learning** concept (mixed methodologies)
10. Develop and use **OER**

Pre-condition for the quality label is a positive assessment of at least 8 of these 10 basic indicators.
Specific Quality Criteria
In the B4C network, the specific course designs are being assessed based on evaluation grids by an external evaluator.
The specific quality criteria are as follows:

1. Variability
2. Productivity

3. Adjustment: to the given/expected situation (of the learners)
4. Productivity and utility
5. Self motivation: for teaching and learning persons
6. Development of learners' abilities (competences)
7. Consistency/Clarity

With 7-10 indicators each to provide a transparent assessment, to give course designers a useful feedback.

The pass score to receive the B4C quality label are:

- General part 80%
- Specific part 70%

The extended evaluation grid is annexed to this report.

Exemplary course score for a project that did not pass:

General Quality Criteria		
Criterion	**-**	**+**
1. Have a **competence-oriented** approach		x
2. Reach out **beyond formal** education		x
3. **Collaborative Learning** / learning culture communities		x
4. Be **Needs Driven** (learner oriented)		x
5. Promote **Constructive** learning	x	
6. Foster **Innovation and creativity**		x
7. Promote **Interdisciplinary** (intersectoral) learning	x	
8. Promote **Interactive** learning		x
9. Offer a **blended learning** concept (mixed methodologies)		x
10. Develop and use **OER**	x	
General COL criteria fullfilled?	**No**	

	not at all	just a little	quite a bit	rather much	much	very much
Specific Quality Criteria	**---**	**--**	**-**	**+**	**++**	**+++**
Criterion	**1**	**2**	**3**	**4**	**5**	**6**
1. Variability					5	
2. Productivity			3			
3. Adjustment to the given situation (of the learners)				4		
4. Productivity and utility					5	
5. Self motivation: for teaching and learning persons					5	
6. Development of learners' abilities (competences)			3			
7. Consistency/Clarity				4		
B4C specific Score	**69%**					

	1	2	3	4	5	6
EQF level range						
LEVEL5 range						

Successfully assessed courses that fulfil the B4C quality criteria receive the B4C quality label which can be attached to the course programmes, for instance on the provide platform.

2.2. Certified B4C Courses

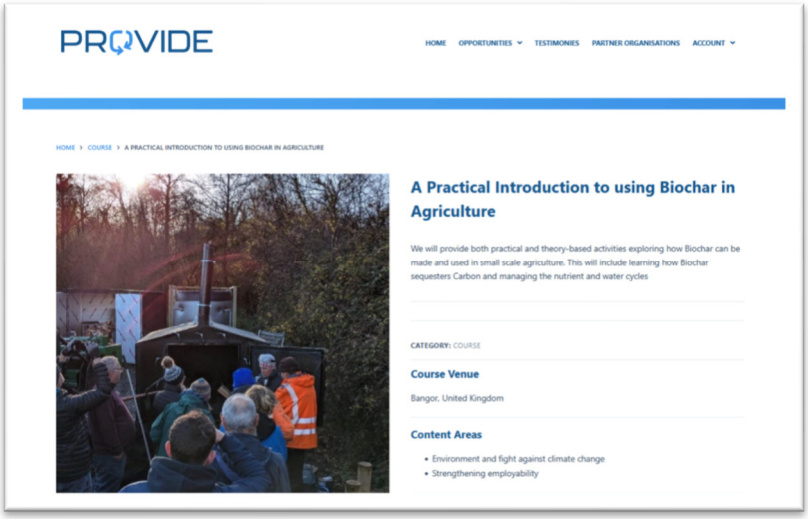
The report/repository on hand contains the high-quality courses which were designed and delivered by the B4C partners for their sectoral target groups ("final VET beneficiaries"), which have been designed for EQF (ECVET) levels 2-4.

Additionally, also the 2 courses for Carbon Managers and VET trainers have been included in this repository and described along the course patterns and assessed along the B4C quality criteria.

The report reflects the state 04/2026.

All course descriptions can be retrieved from the B4C website (https://b4c.threec.eu/b4c-courses-and-learning-opportunities/).

Those courses that are offered within KA1 offers are published in the European provide platform (e.g. https://provide-eu.org/product/a-practical-introduction-to-using-biochar-in-agriculture/).



3. Courses for VET Learners

3.1. Building with Carbon-Storing Materials (IFSB)

3.1.1. Course Description

Summary

The B4C pilot course developed by IFSB focused on introducing Biochar as a sustainable and innovative material for the construction sector. The initiative responded to the growing need to reduce the carbon footprint of construction materials while supporting circular economy value chains.

Biochar represents a promising solution because it:

- Captures and stores CO2 in a stable form
- Contributes to Climate change mitigation
- Can be integrated into construction materials such as concrete
- Supports the transition toward sustainable construction practices
- The pilot project was implemented through two complementary learning pathways:
- A theoretical awareness and knowledge development pathway for white-collar professionals
- A practical skills development pathway for blue-collar professionals

The final results included increased awareness of Biochar applications, hands-on experimentation with Biochar-based concrete, and the identification of potential technical trade-offs such as slightly reduced compressive resistance.

Target group

1) White-Collar Participants

- Technicians
- Engineers
- Architects
- Construction professionals involved in design and planning activities

Number of participants:

18 professionals

Training date:

January 29, 2026

2) Blue-Collar Participants

- Masons working in the construction sector

Characteristics:

- Practical construction professionals responsible for material preparation and structural implementation
- Directly involved in concrete production and building activities

Training dates:

Theory session: March 06, 2026 => 12 participants

Practical session: March 20, 2026 => 9 participants

- Themes (content area)

The following themes were addressed during the pilot project:

- Introduction to Biochar and biomass transformation
- Carbon capture and storage mechanisms
- Circular economy principles in construction
- Environmental impact of construction materials
- Sustainable concrete production
- Material properties and performance
- Practical application of Biochar in concrete
- Prototype production and testing preparation

Learning objectives (for final beneficiaries)

- Knowledge:

Participants were expected to understand:

- The definition and production process of Biochar
- The role of Biochar in CO2 storage and climate mitigation
- Environmental benefits of sustainable construction materials
- Basic technical properties of Biochar-based concrete
- The relationship between sustainability and structural performance

Skills:

Participants were expected to develop:

Ability to identify sustainable construction materials

Ability to apply Biochar in concrete mixtures

Ability to produce construction elements using Biochar

Ability to evaluate material behavior in practical conditions

Attitudes:

Participants were encouraged to develop:

- Awareness of environmental responsibility
- Openness to innovation in construction materials
- Critical thinking regarding sustainability-performance trade-offs
- Professional curiosity and experimentation mindset

Methods/Activities

The training methodology combined theoretical learning with hands-on experimentation.

White-Collar Methods

- Technical lectures
- Interactive discussions
- Case-based learning
- Experience sharing

Blue-Collar Methods

- Demonstrations
- Practical exercises
- Real-life material preparation
- Prototype construction (cubes, posts…)
- Group reflection and feedback sessions

Resources and materials

- Biochar material
- Cement
- Aggregates
- Water
- Concrete mixing equipment
- Molds for 15 cm sided cubes
- Construction tools
- Training facilities at the IFSB training center
- Presentation slides and technical documentation
- 2 Trainers + 1 engineer

Biochar was purchased. The rest of the materials were available at IFSB and have been used accordingly to the project's needs.

3.1.2. Quality Assessment

Scores for Quality Label

General Quality Criteria		
Criterion	-	+
1. Have a **competence-oriented** approach		x
2. Reach out **beyond formal** education		x
3. **Collaborative Learning** / learning culture communities		x
4. Be **Needs Driven** (learner oriented)		x
5. Promote **Constructive** learning		x
6. Foster **Innovation and creativity**		x
7. Promote **Interdisciplinary** (intersectoral) learning	x	

8. Promote **Interactive** learning		x				
9. Offer a **blended learning** concept (mixed methodologies)		x				
10. Develop and use **OER**		x				
General COL criteria fullfilled?		**yes**				

	not at all	just a little	quite a bit	rather much	much	very much
Specific Quality Criteria	**---**	**--**	**-**	**+**	**++**	**+++**
Criterion	**1**	**2**	**3**	**4**	**5**	**6**
1. Variability					5	
2. Productivity					5	
3. Adjustment to the given situation (of the learners)					5	
4. Productivity and utility					5	
5. Self motivation: for teaching and learning persons				4		
6. Development of learners' abilities (competences)				4		
7. Consistency/Clarity				4		
B4C specific Score	**76%**					

	1	2	3	4	5	6
EQF level range						
LEVEL5 range						

<u>Development process</u>

IFSB's Biochar pilot training was developed to translate sustainability concepts into practical learning experiences for construction professionals. The approach combined theoretical knowledge and hands-on experimentation, targeting both white-collar professionals (Brevet Q participants) and blue-collar workers (masons).

In our case, the staged learning sequence—**concept understanding, application, observation, and reflection**—proved to be an effective framework for introducing innovative materials in vocational training.

Positive and key aspects:

- Dual training pathway addressing both technical decision-makers and field professionals
- Strong integration of theory and practical exercises
- Use of real construction materials and working conditions
- Focus on linking sustainability to professional practice

Main challenges / hurdles:

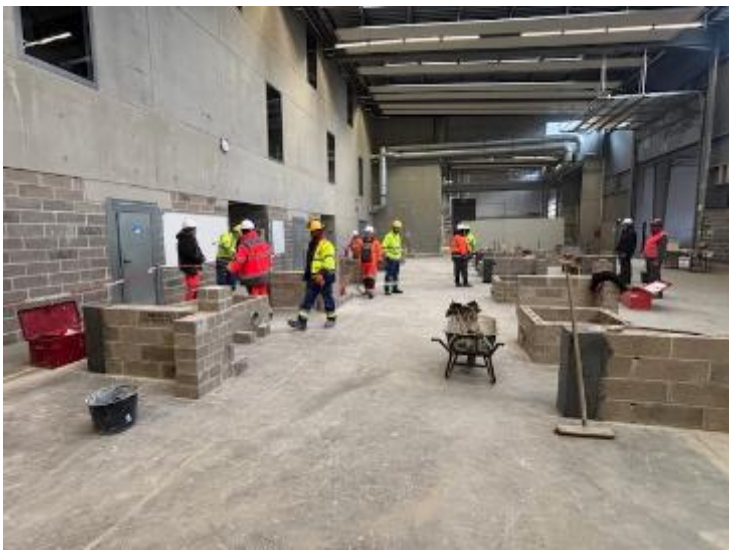
- Explaining performance trade-offs between sustainability and mechanical resistance
- Ensuring consistent mixing procedures during practical exercises
- Managing expectations regarding new material performance

Innovative elements of the concept:

- Introduction of an emerging low-carbon material
- Integration of environmental and technical competencies
- Combination of theory and practical experimentation
- Focus on climate change mitigation in vocational training

Learner /trainees feedback:

- High interest in practical activities
- Positive perception of working with new materials
- Recognition of the relevance of sustainability in construction
- Requests for more testing and extended practical session



3.2. Biochar Urban Garden Booster (FUU)

3.2.1. Course Description

Summary

At Folkuniversitetet, Sweden, adult learners enrolled in the Gardening course participated in the online course and in a student-led micro-experiment focused on using biochar to improve soil quality in small urban gardens. These settings included school gardens, community plots, and rooftop planters. Learners investigated how biochar influences plant growth, water retention, and soil health.

This pilot was selected because it offers an accessible and hands-on entry point into the carbon cycle and the circular economy. By observing and measuring differences between biochar-amended and non-amended soil, students developed both practical skills and scientific literacy.

The final result of the pilot was a comparative dataset documenting measurable differences between biochar-treated and untreated soil plots, collected and analysed by the students themselves.

Target group

The pilot involved adult learners (VET students) attending Folkuniversitetet's Gardening course. Participants came from vocational training backgrounds including:

- Agriculture
- Horticulture
- Natural sciences
- Landscaping

These are adult learners with varied prior experience, united by an interest in practical, sustainable cultivation practices.

Themes (content area)

- Biochar: production, properties, and applications
- Soil science: structure, water retention, and nutrient cycling
- Carbon sequestration and the carbon cycle
- Circular economy principles in urban agriculture
- Scientific observation and data collection methods
- Sustainable urban gardening and climate-smart horticulture

Learning objectives (for final beneficiaries)

Knowledge:

- The properties of biochar and how it differs from regular compost or organic matter
- The basic principles of the carbon cycle and how biochar contributes to carbon sequestration
- How soil amendments affect plant growth, water retention, and soil microbiology
- The role of circular economy practices in sustainable agriculture

Skills:

Learners were expected to develop practical competencies in:

- Setting up and managing a controlled micro-experiment (biochar vs. control plots)

- Systematic observation and scientific data collection (soil moisture, plant height, leaf health)
- Analysing and interpreting comparative datasets
- Applying biochar correctly to soil in garden or planter settings

Attitudes:

The pilot aimed to foster:

- Curiosity and openness toward innovative, nature-based solutions
- A sense of personal agency in addressing climate challenges through everyday horticultural practice
- Commitment to evidence-based decision-making in sustainable gardening
- Appreciation for the intersection of science, ecology, and circular economy thinking

Methods/Activities

- Introduction lecture and discussion: What is biochar? Why does it matter for soil and climate?
- Hands-on setup of micro-experiment plots: learners prepared paired plots/planters with and without biochar amendment
- Ongoing observation and data logging: students measured soil moisture, tracked plant growth, and noted visible differences over several weeks
- Group data analysis session: learners compiled their individual datasets into a group comparison
- Reflection and presentation: small groups presented findings and discussed implications for urban gardening practice

Resources and materials

- Biochar (sourced/procured for the course; learners were briefed on its provenance and production method)
- Garden plots, planters (school/community facilities)
- Soil moisture meters, rulers, and observation sheets
- Presentation slides introducing biochar and the carbon cycle (developed by the teaching team)
- Data recording templates (developed for the pilot)
- Reference materials on circular economy and sustainable horticulture

3.2.2. Quality Assessment

Score:

General Quality Criteria		
Criterion	**-**	**+**
1. Have a **competence-oriented** approach		x
2. Reach out **beyond formal** education		x
3. **Collaborative Learning** / learning culture communities		x
4. Be **Needs Driven** (learner oriented)		x
5. Promote **Constructive** learning		x
6. Foster **Innovation and creativity**		x
7. Promote **Interdisciplinary** (intersectoral) learning		x
8. Promote **Interactive** learning		x
9. Offer a **blended learning** concept (mixed methodologies)		x
10. Develop and use **OER**		x
General COL criteria fullfilled?		**yes**

	not at all	just a little	quite a bit	rather much	much	very much
Specific Quality Criteria	**---**	**--**	**-**	**+**	**++**	**+++**
Criterion	**1**	**2**	**3**	**4**	**5**	**6**
1. Variability					5	
2. Productivity						6
3. Adjustment to the given situation (of the learners)						6
4. Productivity and utility					5	
5. Self motivation: for teaching and learning persons				4		
6. Development of learners' abilities (competences)					5	
7. Consistency/Clarity				4		
B4C specific Score	**83%**					

	1	2	3	4	5	6
EQF level range						
LEVEL5 range						

Development process

The development of the Biochar Urban Garden Booster pilot followed an iterative design process rooted in the B4C project methodology. The core concept – applying biochar in accessible urban garden settings – was chosen deliberately to lower the entry threshold for adult learners unfamiliar with soil science or carbon concepts.

The most successful element of the development phase was identifying the right scale: by keeping the experiment small (individual planters or paired beds) and the measurement tools simple (moisture meters, rulers, observation sheets), we were able to focus learner energy on observation and thinking rather than complex equipment management.

The main challenge was sourcing biochar reliably and ensuring consistent quality across plots. Some time was spent communicating to learners why experimental consistency matters – a challenge that ultimately became a valuable learning moment about scientific rigour.

Impact

The pilot was innovative in its combination of hands-on experimentation with circular economy theory in a gardening context. Most standard horticulture courses do not link practical soil work to climate science and systemic sustainability thinking in this way.

Learner feedback was positive. Participants highlighted the satisfaction of seeing tangible results from their own plots, and several expressed that the experiment changed how they think about soil and waste. A small number of learners expressed initial frustration with the pace of plant growth, which is a natural constraint of biological experiments.

The experience of integrating design thinking into a practical horticultural session was new to us and will inform how we approach other hands-on modules going forward. We also developed a stronger sense of how to scaffold learner-led inquiry – giving enough structure to ensure productive outcomes while leaving space for genuine discovery.

3.3. From Garden Waste to Biochar: A Low-Tech Pyrolysis Approach (blinc)

3.3.1. Course Description:

Summary

The learning project focused on raising awareness about the potential of biomass resources in allotment gardens (“Schrebergärten”, DE) and demonstrating how biomass can be transformed into a valuable climate protection and soil improvement product through pyrolysis.
The project was implemented with 8 tenants sharing a plot in an allotment garden colony in Göttingen, Germany. The idea emerged from the observation that considerable amounts of biomass are generated every year in allotment gardens through pruning, weeds, grass clippings, and other plant residues. Most of this biomass is either composted or disposed of without considering its additional value for carbon sequestration and soil enhancement.
The main objectives were to help participants understand biomass flows within their garden plot, calculate the amount of biomass produced annually, learn about the principles and benefits of biochar production, and gain practical experience in producing and applying biochar.
During the workshop, participants estimated the annual biomass production of their plot and identified the proportion that was currently underutilized and suitable for conversion through low-tech pyrolysis. The benefits of pyrolysis and biochar for climate protection, soil health, nutrient and water retention were discussed. In a hands-on activity, participants produced biochar using a mini-Kon-Tiki kiln, activated the biochar with stinging nettle tea, and applied it directly to the garden soil.
An additional "Stakeholder and Biochar Network Mapping” exercise was carried out to assess the wider impact of the approach. Participants extrapolated the biomass calculations from their plot to the entire allotment garden colony and estimated the potential quantities of biochar and carbon that could be stored if more gardeners adopted the practice. This exercise encouraged participants to think beyond their own garden and consider collective action within the community.
The workshop concluded with a discussion on involving tenants from other plots and exploring future collaboration opportunities. As a result, participants developed a new perspective on biomass as a valuable resource and gained practical knowledge about circular bioeconomy solutions at the local level. Furthermore, participants recognized the potential of biochar not only as a soil amendment and climate mitigation tool, but also as a catalyst for community building, cooperation, and collective action within the allotment garden community.

Target group

The target group consisted of 8 adult members of a shared allotment garden plot in Göttingen. The participants were between approximately 26 and 45 years old and represented diverse professional backgrounds, including students, social workers, nature conservation practitioners, forestry scientists, and consumer protection professionals.

Most participants had practical gardening experience but little prior knowledge of biochar production, pyrolysis technologies, or the role of biomass management in climate protection and circular economy concepts.

Themes (content area)

- Biomass resources in allotment gardens
- Circular economy and local resource cycles

- Introduction to biochar and pyrolysis
- Carbon sequestration and climate protection
- Soil fertility and soil improvement
- Sustainable biomass management
- Estimation and calculation of biomass potentials
- Community-based environmental action
- Stakeholder mapping and scaling approaches

Learning objectives (for final beneficiaries)

- Knowledge

Participants were expected to:

- Understand the concept of biomass as a renewable resource.
- Learn the basic principles of pyrolysis and biochar production.
- Understand the environmental benefits of biochar, including carbon storage and soil improvement.
- Recognize the connection between local biomass management and climate protection.
- Understand how local biomass potentials can contribute to larger-scale environmental impacts.

- Skills

Participants were expected to:

- Estimate and calculate biomass quantities generated on their garden plot.
- Identify suitable biomass materials for biochar production.
- Safely operate a mini-Kon-Tiki kiln under supervision.
- Produce and activate biochar using locally available organic resources.
- Apply biochar appropriately in garden soils.
- Calculate and visualize biochar potential for larger groups of garden plots.
- Discuss opportunities for scaling biomass utilization within their community.

- Attitudes

Participants were expected to:

- Develop greater appreciation for biomass as a valuable resource rather than waste.
- Increase their motivation to contribute to climate protection through local action.
- Strengthen their interest in sustainable gardening practices.
- Foster a collaborative attitude towards community-based environmental initiatives.
- Recognize the value of collective action in achieving environmental goals.

Methods/Activities

The project combined participatory, experiential, and inquiry-based learning approaches with elements of Design Thinking. The learning process was designed around a real-world sustainability challenge: how to better utilize locally available biomass resources in allotment gardens while contributing to soil health, climate protection, and circular economy objectives.

Participants were guided through a learning journey that reflected key phases of the Design Thinking process:

- **Empathise and Understand:** Participants explored their own gardening practices and reflected on how biomass is currently generated, managed, and often overlooked as a resource. Through facilitated discussions, they connected their personal experiences with broader sustainability challenges.
- **Define:** Together, participants analysed biomass flows on their garden plot and identified the challenge of underutilized biomass that could potentially be transformed into a valuable resource through low-tech pyrolysis.
- **Ideate:** Participants discussed alternative biomass management strategies and explored opportunities for biochar production, soil improvement, carbon sequestration, and community engagement. Different future scenarios and stakeholder perspectives were considered.
- **Prototype:** Through a hands-on activity, participants produced biochar using a mini-Kon-Tiki kiln, activated it with nettle manure (Brennnesseljauche), and applied it in the garden. This practical experimentation allowed them to test a tangible circular economy solution in a real-world setting.
- **Test and Reflect:** Participants evaluated the process, discussed expected impacts, and reflected on lessons learned. Through a Community Stakeholder and Biochar Network Mapping exercise, they explored how the approach could be adapted, improved, and scaled within the allotment garden community and beyond.

The methodology combined:

- Knowledge inputs, mainly delivered via the biochar course
- Participatory discussions and peer learning,
- Inquiry-based exploration of local biomass resources,
- Collaborative problem-solving and systems thinking,
- Practical experimentation and prototyping,
- Stakeholder mapping and community-oriented innovation,
- Structured reflection and knowledge exchange.

Resources and materials

B4C Project Resources

- Biomass Factsheet (calculation template for estimating biomass potential)
- THREE C Circular Carbon Management System (CCMS) tool for assessing carbon sequestration potentials.
- Stakeholder Map (template for identifying relevant actors and collaboration opportunities)

- B4C Biochar Box including a Mini-Kon-Tiki kiln for small-scale biochar production.

Existing and Locally Available Resources

- Gardening tools available on-site (rakes, shovels, buckets, wheelbarrows).
- Biomass generated within the allotment garden (pruning residues).
- Stinging nettle tea for biochar activation.
- Meeting and workshop space within the allotment garden.

3.3.2. Quality Assessment

Scoring and Quality Assessment

General Quality Criteria		
Criterion	**-**	**+**
1. Have a **competence-oriented** approach		x
2. Reach out **beyond formal** education		x
3. **Collaborative Learning** / learning culture communities		x
4. Be **Needs Driven** (learner oriented)		x
5. Promote **Constructive** learning		x
6. Foster **Innovation and creativity**		x
7. Promote **Interdisciplinary** (intersectoral) learning		x
8. Promote **Interactive** learning		x
9. Offer a **blended learning** concept (mixed methodologies)		x
10. Develop and use **OER**		x
General COL criteria fullfilled?		**yes**

	not at all	just a little	quite a bit	rather much	much	very much
Specific Quality Criteria	**---**	**--**	**-**	**+**	**++**	**+++**
Criterion	**1**	**2**	**3**	**4**	**5**	**6**
1. Variability					5	
2. Productivity						6
3. Adjustment to the given situation (of the learners)						6
4. Productivity and utility					5	
5. Self motivation: for teaching and learning persons					5	
6. Development of learners' abilities (competences)					5	
7. Consistency/Clarity				4		
B4C specific Score	**86%**					

	1	2	3	4	5	6
EQF level range						
LEVEL5 range						

Development Process

One advantage during the development and implementation of the project was that the target group was easy to engage. As active gardeners, participants were already familiar with biomass management and regularly encountered the challenge of dealing with surplus pruning residues from shrubs and trees. Many reported that woody biomass occupies valuable space in compost piles for long periods because it decomposes only slowly. Because participants already experienced this issue in their everyday gardening practice, they immediately recognized the relevance of the topic and were very open to exploring alternative biomass management approaches. This existing awareness provided a strong foundation for discussions about pyrolysis, biochar production, and circular resource use. Rather than introducing a completely new problem, the workshop offered a practical solution to a challenge that participants were already facing.

Impact and Perspective

The concept was innovative because it combined systems thinking, practical experimentation, and community engagement within a single learning activity. An interesting outcome was that discussions increasingly focused on community building. Participants identified opportunities to involve other gardeners and local actors, recognizing biochar as a potential catalyst for cooperation and collective action. Feedback was very positive. Participants particularly appreciated the practical approach and the opportunity to transform surplus pruning residues into a useful product for their garden.
The combination of biomass assessment, biochar production, and a future scaling scenario should remain central to future workshops. Future improvements could include follow-up activities that encourage participants to observe and exchange experiences regarding the development of their garden beds after biochar application. Such activities could help maintain curiosity, strengthen peer learning, and keep participants engaged over a longer period of time. Involving representatives of the allotment garden association from the outset could further strengthen opportunities for wider adoption within the garden colony and support the development of community-led biochar activities.

Testimony

One of the most important insights for us as trainers was the importance of reaching learners in the right setting. Because the workshop addressed a real challenge that participants already faced in their everyday gardening activities, motivation and engagement were high from the beginning. We also learned how much responsibility can be entrusted to learners when a topic is practically relevant. Participants contributed their own ideas, observations, and research, requiring less expert input than expected. This reinforced our belief that learner-centred approaches work particularly well when participants are motivated to solve a problem that is meaningful to them. In future courses, we will continue to focus on authentic learning environments, real-world challenges, and giving learners more space for self-directed exploration and exchange.

3.4. From Circular Carbon Economy to Sustainable Construction (blinc)

3.4.1. Course Description

Summary

The learning course focused on exploring the potential of biochar as an innovative component in earthen construction materials. The project combined practical material development, demonstration activities, and hands-on learning experiences to introduce learners and interested stakeholders to the emerging field of biochar-clay composites.

Biochar-clay materials are gaining increasing attention as sustainable building materials due to their potential to combine carbon storage, moisture regulation, low environmental impact, and improved thermal performance. While research in this field is still developing, biochar-clay composites offer promising opportunities for climate-friendly construction and building renovation.

As part of the project, different mixtures of clay plaster and biochar were developed and applied as interior plaster finishes in an office building. The demonstration surfaces contain varying proportions of biochar and allow visitors to directly compare different material compositions and visual appearances. These installations serve as long-term demonstration objects that can be visited by learners, professionals, and interested groups.

The project was implemented by the project team in collaboration with skilled craftspeople. The learning process focused on experimenting with different mixtures of clay and biochar, understanding material properties, and applying the mixtures in real construction settings.

A second learning environment was created during the THREE C Network Conference 2026 in Kassel. Conference participants were invited to actively engage with the topic through practical workshops. Participants prepared their own biochar-clay mixtures, experimented with different material compositions, and produced small test samples in the form of earthen dry-construction boards and earthen bricks. Additional natural materials such as hemp fibres, hemp shives, and willow weaving materials could be incorporated into the mixtures, allowing participants to explore different approaches to sustainable material design.

The workshop was complemented by information on current scientific developments regarding biochar-clay composites and their potential use in sustainable construction. Through practical experimentation and discussion, participants gained insight into how Circular Carbon Economy principles can be integrated into the building sector.

3.5. Quality Assessment

Score

General Quality Criteria		
Criterion	**-**	**+**
1. Have a **competence-oriented** approach		x
2. Reach out **beyond formal** education		x
3. **Collaborative Learning** / learning culture communities		x
4. Be **Needs Driven** (learner oriented)		x
5. Promote **Constructive** learning		x
6. Foster **Innovation and creativity**		x
7. Promote **Interdisciplinary** (intersectoral) learning	x	
8. Promote **Interactive** learning		x
9. Offer a **blended learning** concept (mixed methodologies)		x
10. Develop and use **OER**		x
General COL criteria fullfilled?		**yes**

	not at all	just a little	quite a bit	rather much	much	very much
Specific Quality Criteria	**---**	**--**	**-**	**+**	**++**	**+++**
Criterion	**1**	**2**	**3**	**4**	**5**	**6**
1. Variability						6
2. Productivity						6
3. Adjustment to the given situation (of the learners)						6
4. Productivity and utility					5	
5. Self motivation: for teaching and learning persons					5	
6. Development of learners' abilities (competences)				4		
7. Consistency/Clarity				4		
B4C specific Score	**86%**					

	1	2	3	4	5	6
EQF level range						
LEVEL5 range						

Development Process

The pilot project emerged from the idea of connecting Circular Carbon Economy concepts with practical applications in sustainable construction. While biochar is already being explored in fields such as agriculture, horticulture, and water treatment, its potential in construction remains relatively unknown to many learners and practitioners.

The project team collaborated closely with skilled craftspeople to develop and test different biochar-clay mixtures. A central part of the process involved experimenting with varying proportions of biochar and clay while exploring how additional natural materials such as hemp fibres, hemp shives, and willow weaving materials influence the properties of the mixtures.

One important outcome of the development process was the creation of demonstration surfaces within an office building. These applications transformed the project from a purely experimental activity into a real-world learning environment that can continue to be used for educational purposes.

Outcomes and Impact

The project successfully created both physical demonstration objects and educational learning opportunities.

Participants gained knowledge about sustainable construction materials and developed a deeper understanding of how biochar can contribute to climate-friendly building solutions. Through the practical workshops, learners acquired experience in preparing and processing biochar-clay mixtures and evaluating different material compositions.

The demonstration surfaces provide a long-term educational resource that can be used for future learning activities, site visits, and discussions with different target groups.

The workshop activities also demonstrated that complex concepts such as carbon storage in building materials can be communicated effectively through practical experience.

A significant opportunity to validate the project concept was provided by the THREE C Network Conference 2026 in Kassel. The conference brought together participants from science, industry, education, municipalities, agriculture, and civil society who shared an interest in climate-resilient development and Circular Carbon Economy solutions.

The workshop format enabled participants to engage actively with the topic rather than simply receiving information. By producing their own biochar-clay mixtures and test components, participants developed a more tangible understanding of material properties and sustainability concepts.

The project generated considerable interest because it demonstrated how buildings can contribute not only to reducing emissions but also to storing carbon. This perspective challenged common assumptions about construction materials and stimulated discussions about future applications.

The combination of scientific background information, practical experimentation, and real-world demonstration applications proved highly effective in engaging participants from diverse professional and educational backgrounds.

6. Perspective

The pilot project demonstrated significant potential for further educational and practical development.

Future activities could include:

- Additional testing of material formulations.
- Expansion of demonstration areas.
- Development of educational toolkits focused on sustainable construction materials.
- Integration into vocational training programmes for construction and renovation trades.
- Collaboration with educational institutions and sustainability initiatives.
- Development of multilingual learning resources and workshop formats.

The project also offers opportunities for stronger cooperation between vocational education, research institutions, craftspeople, and sustainability practitioners.

3.6. Climate Farming Project (blinc)

3.6.1. Course Decsription

Starting with 4 experts for adapted technologies in developing countries we carried out a blended learning course which was extended with 3 students and one climate farmer from Northern Hesse.

It consisted of self-learning courses 1&2, related to introduction of biochar properties, application scenarios and the CCE economy plus the agricultural bioeconomy course.

It originated in the challenge on how to introduce the CCE with relatively small budgets but still on high quality and how to envisage the climate effect of the biochar applications in agriculture.

The programme was delivered between March and June 2026 in blended learning based on:

1. The asynchronous B4C learning platform, courses 1 and 2
2. 6 synchronous online sessions
3. Four F2F project development workshops
4. Final Competence validation

The output of this course is a prototype concept of potential biochar applications in the ecosystem of a farm, basically for:

- Soil improvement
- Water storage capacity
- Utilisation of residual biomass
- Addition to slurry, compost and horse dung
- Calculation of CO2 sequestration potential

3.7. Quality Assessment

Score:

General Quality Criteria		
Criterion	**-**	**+**
1. Have a **competence-oriented** approach		x
2. Reach out **beyond formal** education		x
3. **Collaborative Learning** / learning culture communities		x
4. Be **Needs Driven** (learner oriented)		x
5. Promote **Constructive** learning		x
6. Foster **Innovation and creativity**		x
7. Promote **Interdisciplinary** (intersectoral) learning		x
8. Promote **Interactive** learning		x
9. Offer a **blended learning** concept (mixed methodologies)		x
10. Develop and use **OER**		x
General COL criteria fullfilled?		**yes**

	not at all	just a little	quite a bit	rather much	much	very much
Specific Quality Criteria	**---**	**--**	**-**	**+**	**++**	**+++**
Criterion	**1**	**2**	**3**	**4**	**5**	**6**
1. Variability						6
2. Productivity						6
3. Adjustment to the given situation (of the learners)						6
4. Productivity and utility					5	
5. Self motivation: for teaching and learning persons					5	
6. Development of learners' abilities (competences)					5	
7. Consistency/Clarity			3			
B4C specific Score	**86%**					

	1	2	3	4	5	6
EQF level range						
LEVEL5 range						

Development Process

- Very practical since it built on experiences of the other cVET project at another location
- Positive to have a defined ecosystem
- All participants with rather similar backgrounds, it was even possible to integrate also computer experts in the carbon management course
- In the final stage the finalised LMS was of big advantage as well as expert inputs from THREE C network experts.
- The generic parts were delivered via the open biochar course in the B4C platform (https://b4c.threec.eu/biochar-course/) and especially the module "biochar in climate action

(https://b4c.threec.eu/course-biochar-climate-action-active-participation/) and the biochar application scenario “agricultural soils” (https://b4c.threec.eu/agricultural-soils/)

- The learning project has been described (as learner designed OER) in https://b4c.threec.eu/climate-farming/

The concept was quite clear to the participants:

- Knowledge input (in a blended approach /synchronous/asynchronous)
- Exchange and discussions and entry in stage 1 of the design thinking (challenge definition)
- Expert inputs connected to the objectives
- Idea generating on specific sector and purpose (climate farming)
- Involvement of adapted technology approach based on the research tasks and outcomes (intermediate technology for biomass conversion)
- Ideation on an array of climate relevant actions on the farm
- Finishing the concept and prototype development
- Essay and competence validation.

Outcomes and Impact

Within this concept we tried to combine several objectives:

- Introduction of the B4C approach as blended learning approach on local level
- Transferrable approach and resources: We used the asynchronous online material as knowledge input which can be retrieved by biochar lay people who can build up their knowledge in stages (unit by unit).
- Development of a constructive CPD incl. teamwork on innovative application scenarios
- We wanted to implement a “culture” or at least a consciousness for the biochar based CCE
- The CPD should develop:
    - Teaching Competence development for our trainers and experts (EQF5/6)
    - Participants’ competences related to EQF4/5
    - Domain specific competences to develop biochar-based bioeconomy project in a concrete agricultural setting to promote climate friendly management to make the farm mor resilient
    - The validation concept worked well especially in this context without fixed curricula and based on rather flexible learning programme. The validation was embedded in the learning process (as first e-learning units) and only the last LEVEL5 assessment was declared as such. However, the learners could refer back to their first results (the profile) and also reflect on what they have analysed in connection with the sustainability profile of their institution.

Perspective/Testimony

We will continue to plan and deliver our courses and learning projects according to this methodology. This relates to learning offers in VET but it should be transferred also to AE and HEI, in which specific learning projects can be initiated.
We achieved a high level of commitment of students and experts from the field since all involved were committed to develop the biochar-based approach for resilient farms in this short sub-project.
The students really enjoyed it and could be activated in a way that most of us haven’t yet experienced. The contents and practical application could take up the curiosity of the learners and collaborators and due to the reasonable project setting, everybody involved was highly motivated to go further with this project.

3.8. Biochar in Slurry (DEULA)

3.8.1. Course Description

Summary
This learning activity is designed as a practice-oriented vocational education project focusing on the role of biochar within nutrient management and slurry systems. The educational approach combines sustainability-related agricultural topics with collaborative learning, experimentation and Design Thinking methodologies.
The learning activity should help participants understand current environmental challenges related to manure and slurry management, particularly nutrient losses, ammonia emissions and inefficient resource use within agricultural systems.
Facilitators should guide learners through a combination of:

- theoretical input,
- practical experimentation,
- collaborative analysis,
- and problem-solving activities.

3.8.2. Quality Assessment

Score

General Quality Criteria		
Criterion	**-**	**+**
1. Have a **competence-oriented** approach		x
2. Reach out **beyond formal** education		x
3. **Collaborative Learning** / learning culture communities		x
4. Be **Needs Driven** (learner oriented)		x
5. Promote **Constructive** learning		x
6. Foster **Innovation and creativity**		x
7. Promote **Interdisciplinary** (intersectoral) learning	x	
8. Promote **Interactive** learning		x
9. Offer a **blended learning** concept (mixed methodologies)		x
10. Develop and use **OER**		x
General COL criteria fullfilled?		**yes**

	not at all	just a little	quite a bit	rather much	much	very much
Specific Quality Criteria	**---**	**--**	**-**	**+**	**++**	**+++**
Criterion	**1**	**2**	**3**	**4**	**5**	**6**
1. Variability					5	
2. Productivity					5	
3. Adjustment to the given situation (of the learners)						6
4. Productivity and utility					5	
5. Self motivation: for teaching and learning persons					5	
6. Development of learners' abilities (competences)					5	
7. Consistency/Clarity				4		
B4C specific Score	**83%**					

	1	2	3	4	5	6
EQF level range						
LEVEL5 range						

Development process

The development and realisation of the learning course concept was strongly influenced by the intention to combine theoretical knowledge with practical application and collaborative learning. The pilot was designed around a clear thematic focus on biochar in slurry management, which allowed for a structured yet flexible learning process. A key element in the development phase was the preparation of teachers through a Design Thinking workshop, where the overall concept and learning pathway were created.

During the development process, one of the most successful aspects was the clear connection between real agricultural challenges and the learning activities. This helped to ensure a high level of relevance and engagement among the learners. At the same time, some challenges emerged,

particularly regarding the integration of the pilot into existing training schedules and institutional frameworks. Adjusting the timing and aligning the pilot with ongoing courses required flexibility and coordination. Nevertheless, the development phase provided a strong foundation for the successful implementation of the pilot.

Contents:

The project addressed several key contents related to Sustainability Literacy and Education for Sustainable Development (ESD). These included circular economy principles, resource efficiency, emission reduction, and the environmental impact of agricultural practices, particularly in relation to slurry management. The more general topics were addressed via the open biochar course in the B4C platform (https://b4c.threec.eu/biochar-course/) and especially the module "biochar in agriculture (https://b4c.threec.eu/course-biochar-in-agriculture/) The topic of biochar served as a linking element, connecting ecological, economic and practical dimensions of agriculture.
The content proved to be highly relevant for vocational education and could be effectively embedded into existing programmes. In particular, it can be integrated into modules related to soil management, fertilisation, nutrient cycles and environmental protection. The systemic perspective introduced through the concept of Circular Carbon Economy provides an additional framework that can enrich agricultural training in a sustainable way.

Impact

The impact of the project was clearly reflected in the high level of learner motivation and participation. Compared to traditional teaching formats, the pilot offered a more interactive, practice-oriented and learner-centred approach. This was perceived as highly engaging by the participants.
The concept can be considered innovative, particularly due to the integration of Design Thinking, experimentation and real-world problem-solving into vocational education. Feedback from learners was very positive, especially regarding the hands-on experiment and the opportunity to work collaboratively. The project also contributed to raising awareness of sustainability issues and circular economy approaches in agriculture.

Perspective

Based on the first implementation, several conclusions can be drawn for future iterations. The overall structure and methodology of the pilot should be maintained, as they proved to be effective and well-received. In particular, the combination of Design Thinking, practical experimentation and collaborative learning should remain a central element.
However, improvements could be made by allowing more time for practical activities and experimentation. The integration of real farm data and closer cooperation with agricultural enterprises would further enhance the relevance of the learning experience. In addition, expanding the experimental component with more advanced methods could provide deeper insights and strengthen the scientific dimension of the pilot.

4. Courses for Professionals

4.1. Continuing Professional Development for VET Trainers

4.1.1. Course description

Summary

The Continuing Professional Development (CPD) course for vocational education and training (VET) professionals was developed within the Erasmus+ project B4C – Biochar and Circular Carbon Economy to strengthen the competences of teachers, trainers and educational developers in the emerging field of biochar and Circular Carbon Economy (CCE).

The course recognised that the transition towards climate-neutral and circular production systems requires educational professionals who are capable of designing competence-oriented learning environments and facilitating interdisciplinary innovation. Consequently, the programme combined domain-specific knowledge on biochar with modern educational methodologies, enabling participants not only to understand technical concepts but also to integrate them into vocational education.

The pilot was delivered as a highly blended learning programme consisting of four interconnected phases:

- self-directed online preparation using the B4C Moodle platform and the open Biochar Course;
- two synchronous online sessions introducing the learning environment and collaborative working methods;
- a five-day face-to-face workshop in Göttingen combining expert inputs, practical workshops, excursions and collaborative design activities; and
- two online follow-up sessions supporting reflection, transfer and the development of institutional learning projects.

More than twenty VET professionals from several European countries participated in the pilot. Their diverse professional backgrounds created an interdisciplinary learning environment that encouraged peer learning, international exchange and collaborative innovation.

This report documents the educational concept, implementation and outcomes of the pilot and provides a practical reference for future editions of the programme.





Pilot Learning Projects

A central element of the programme was the development of collaborative learning projects.

Working in international teams, participants identified authentic educational challenges related to biochar and Circular Carbon Economy and developed prototype learning concepts suitable for implementation within their own institutions.

The projects demonstrated how competence-oriented educational design can be adapted to different vocational contexts and provided valuable practical experience in interdisciplinary collaboration.

Many concepts subsequently formed the basis for local pilot activities carried out by the project partners.

4.1.2. Quality Assessment

Scores

General Quality Criteria		
Criterion	**-**	**+**
1. Have a **competence-oriented** approach		x
2. Reach out **beyond formal** education		x
3. **Collaborative Learning** / learning culture communities		x
4. Be **Needs Driven** (learner oriented)		x
5. Promote **Constructive** learning		x
6. Foster **Innovation and creativity**		x
7. Promote **Interdisciplinary** (intersectoral) learning		x
8. Promote **Interactive** learning		x
9. Offer a **blended learning** concept (mixed methodologies)		x
10. Develop and use **OER**		x
General COL criteria fullfilled?		**yes**

	not at all	just a little	quite a bit	rather much	much	very much
Specific Quality Criteria	**---**	**--**	**-**	**+**	**++**	**+++**
Criterion	**1**	**2**	**3**	**4**	**5**	**6**
1. Variability						6
2. Productivity						6
3. Adjustment to the given situation (of the learners)				4		
4. Productivity and utility					5	
5. Self motivation: for teaching and learning persons						6
6. Development of learners' abilities (competences)					5	
7. Consistency/Clarity				4		
B4C specific Score	**86%**					

	1	2	3	4	5	6
EQF level range						
LEVEL5 range						

Learning Experience

Participant feedback confirmed that the combination of online preparation, intensive face-to-face collaboration and supported transfer created a highly effective learning environment.

The blended format allowed participants to arrive with a common knowledge base, making the face-to-face workshop highly interactive and practice-oriented.

The international composition of the group was consistently regarded as a major strength, enabling participants to exchange experiences across different educational systems and professional cultures.

The collaborative development of learning projects strengthened ownership of the educational concepts and supported the transfer of learning into everyday professional practice.

Results and Impact

The pilot successfully demonstrated the feasibility of the B4C educational approach.

Participants strengthened both their domain competences in biochar and Circular Carbon Economy and their pedagogical competences in competence-oriented curriculum design.

The programme also produced a series of prototype learning projects, strengthened institutional cooperation among partner organisations and established a European community of practice for vocational educators.

Beyond the immediate learning outcomes, the pilot provided valuable validation of the B4C Competence Framework, Learning Design and digital learning environment.

The pilot confirmed the effectiveness of combining online learning with intensive face-to-face collaboration and structured transfer activities.

Several recommendations emerged:

- maintain the blended learning pathway;
- continue using authentic regional challenges as learning contexts;
- strengthen peer learning and interdisciplinary collaboration;
- provide sufficient time for collaborative project development;
- further expand the repository of practical implementation examples; and
- continue supporting participants through the emerging THREE C educational community.

These lessons will inform future editions of the programme, which will be offered in 2027 in DE and the UK.

4.2. Carbon Manager Course

4.2.1. Summary

The Carbon Manager Course was developed within the B4C and THREE C projects to prepare professionals for implementing Circular Carbon Economy (CCE) solutions at regional level. Whereas the Continuing Professional Development course concentrated on educational innovation for VET trainers, the Carbon Manager Course addressed the practical planning, coordination and implementation of regional biochar value chains for professionals who aim to invent practical bioeconomy scenarios in their working or living contexts.

The course responded to the growing demand for professionals capable of connecting technical, environmental, organisational and economic aspects of carbon management. Participants explored how residual biomass can be transformed into stable carbon products while simultaneously supporting climate mitigation, regional value creation and circular bioeconomy development.

The pilot followed a highly blended learning approach consisting of five online learning sessions and a four-day collaborative workshop integrated into the European conference on biochar, sponge cities and climate resilience. Throughout the programme participants worked in international teams on authentic regional implementation scenarios, applying the Circular Carbon Management System (CCMS) and developing prototype projects for their own regions.

More than twenty participants from municipalities, research organisations, universities, advisory services, SMEs and regional initiatives took part. Their interdisciplinary expertise created an ideal environment for collaborative planning and transnational exchange.

This report documents the concept, implementation and outcomes of the pilot and serves as a practical reference for future Carbon Manager programmes.

The pilot was organised over approximately six months and combined synchronous online learning with an intensive collaborative workshop.

The first online sessions introduced participants to biochar technologies, regional biomass analysis, stakeholder mapping and the Circular Carbon Management approach.

The face-to-face collaboration week represented the practical core of the programme. Participants attended conference sessions, visited demonstration activities and worked in transnational teams to develop regional Circular Carbon Economy concepts. Practical workshops focused on biomass assessment, stakeholder analysis, value chain design, carbon calculations and prototype development.

The final online sessions supported the completion of regional implementation concepts, the preparation of carbon balances and the evaluation of project results.

This blended learning pathway enabled participants to continuously develop and refine their regional implementation strategies.

4.2.2. Quality Assessment

Score

General Quality Criteria		
Criterion	**-**	**+**
1. Have a **competence-oriented** approach		x
2. Reach out **beyond formal** education		x
3. **Collaborative Learning** / learning culture communities		x
4. Be **Needs Driven** (learner oriented)		x
5. Promote **Constructive** learning		x
6. Foster **Innovation and creativity**		x
7. Promote **Interdisciplinary** (intersectoral) learning		x
8. Promote **Interactive** learning		x
9. Offer a **blended learning** concept (mixed methodologies)		x
10. Develop and use **OER**		x
General COL criteria fullfilled?		**yes**

	not at all	just a little	quite a bit	rather much	much	very much
Specific Quality Criteria	**---**	**--**	**-**	**+**	**++**	**+++**
Criterion	**1**	**2**	**3**	**4**	**5**	**6**
1. Variability						6
2. Productivity						6
3. Adjustment to the given situation (of the learners)				4		
4. Productivity and utility					5	
5. Self motivation: for teaching and learning persons						6
6. Development of learners' abilities (competences)					5	
7. Consistency/Clarity				4		
B4C specific Score	**86%**					

	1	2	3	4	5	6
EQF level range						
LEVEL5 range						

Learning Experience

Participants consistently valued the practical and interdisciplinary nature of the programme.

The combination of expert inputs, collaborative workshops, conference participation and regional project development enabled participants to experience the complexity of Circular Carbon Economy implementation while working on authentic regional challenges.

The international working groups encouraged exchange between different professional backgrounds and regional contexts. Participants appreciated the opportunity to compare approaches, discuss practical barriers and jointly develop transferable implementation concepts.

The application of the CCMS helped participants understand carbon management not merely as carbon accounting but as a strategic process supporting regional planning and stakeholder cooperation.

Results and Impact

The pilot demonstrated that implementation-oriented competence development can effectively support the introduction of Circular Carbon Economy initiatives.

Participants strengthened their competences in biomass analysis, stakeholder engagement, regional planning, carbon management and collaborative project development.

The course produced several prototype implementation concepts that can be further developed within participating regions. It also validated the practical applicability of the Circular Carbon Management System and strengthened the European network of professionals working on regional carbon management.

Beyond the direct learning outcomes, the programme contributed to the emerging THREE C community by preparing a first generation of Carbon Managers capable of supporting future regional implementation projects.

Perspectives

The Carbon Manager Course successfully demonstrated how competence-oriented learning can prepare professionals to initiate and coordinate Circular Carbon Economy activities within their own regions.

By combining systems thinking, technical knowledge, stakeholder cooperation, Design Thinking and carbon management tools, the programme created a practical learning environment that directly supports regional climate action.

The course complements the B4C Continuing Professional Development programme by shifting the focus from educational design to implementation. Together, both programmes establish the educational pathway of the emerging THREE C / B4C professionalisation programme: educators are prepared to teach the Circular Carbon Economy, while Carbon Managers are equipped to implement it.

Future editions will continue within the THREE C network and support the expansion of regional Circular Carbon Economy initiatives across Europe.

5. Annex: Detailed Evaluation Grid

No.		Theme/questions	not at all	just a little	quite a bit	rather much	much	very much	not applicable
			- - -	- -	-	+	++	+++	0
1		**Variability: The programme**							
	1	addresses to several senses							
	2	uses several didactic methods/models							
	4	aims at cognitive, affective and activity related developments							
	5	changes between phases of tension and relaxation							
	7	includes individual and collaborative activities							
	8	motivates learners with different ways of learning							
	9	has opportunities to learn in other situations than sitting in a room							
	10	changes between guided and self-directed learning							
	11	allows for different learning locations							
2		**Productivity**							
	1	avoids counterproductive effects like a negative attitude towards learning							
	2	uses as far as possible simple and reasonable means and media (available)							
	3	converts much “teaching time” into effective learning time							
	4	delivers additional knowledge without greater efforts by the learners							
	5	avoids learning disorders							
	6	uses means which are trouble-free							
	8	builds up on the given knowledge and abilities of the learners							
3		**Adjustment: to the given/expected situation (in relation to)**							
	2	previous knowledge of the learners							
	5	resilience of the learners							
	6	resources that learners are used to							
	7	those tasks which result from the specific life and professional context							
	8	preferred ways of communication							
	9	time preferences of the learners and of their learning environment							
	10	interests of the learners to increase motivation							

No.		Theme/questions	not at all	just a little	quite a bit	rather much	much	very much	not applicable
4		**Productivity and utility (the programme…)**							
	1	supplies cognitive schemes (e.g. methods that can be generalised).							
	2	helps the learners to gain more routine							
	3	offers a line of orientation							
	4	relates to key competences							
	5	creates and improves contacts (e.g. to other learners, practitioners)							
	6	corresponds to external requirements (e.g. by external boards or experts)							
	7	is adjusted/related to the purpose							
5		**Self motivation: for teaching and learning persons (the programme…)**							
	1	shows the learner especially the positive effects of what he/she has already learnt							
	2	delivers a suitable basis for fruitful questions							
	3	offers also learning in a playful way							
	4	is aiming also at learning in a social way							
	6	is carried out without glancing too much at a certification							
	8	promotes the learning rather in competition with oneself and not to others							
6		**Development of learners' abilities (the programme…)**							
	1	increases the moral sensibility of the learner (attitudes)							
	2	increases the cognitive competences of the learners							
	3	promotes the creativity of the learners							
	6	increases the communication abilities of the learners							
	7	gives the learners a better self-esteem (self confidence)							
	8	promotes the decision-making ability of the learners							
	9	increases the sense of responsibility of the learners							

No.		Theme/questions	not at all	just a little	quite a bit	rather much	much	very much	not applicable
7		**Consistency**							
	1	close distinction/distribution between the various modalities of blended learning							
	2	Facilitators are experienced in handling the electronic devices							
	3	no serious discrepancies between what is said and what is done							
	4	the teaching people “live” what they are imparting/delivering							
	5	high quality of written, visualised and audiovisual material							
	6	high quality of activity related learning (tasks, games)							
	7	delivers tasks which agree with the practical requirements							
	8	gives learners as much room for acting as in professional practice of daily routine							
	9	equally distributes the learning challenges (difficulty-grades)							