B4C Support Hub and Learning Suite

Deliverable 41

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1. Introduction

1.1. Implementation Logic of the B4C Learning Suite

The B4C Learning Suite was developed as the digital learning component of the B4C Support Hub. It brings together structured courses, self-learning resources, methodological guidance, thematic content and reusable teaching materials in one wider online learning environment. The aim is to support facilitators, VET organisations, teachers, learners and stakeholders who want to understand, adapt or implement B4C learning activities on biochar, the Circular Carbon Economy and sustainable regional development.

The Learning Suite follows a two-environment structure:

1. The Moodle-based Learning Suite
   This is the structured learning and resource environment for courses, facilitation support and teaching materials. It mainly addresses teachers, trainers, facilitators, VET organisations and educational professionals who want to plan, deliver, document or adapt B4C-related learning activities.

2. The open-access Biochar Course on WordPress
   This is the public thematic entry point into biochar and the Circular Carbon Economy. It introduces a wider audience to the biomass-to-biochar value chain through the four modules Biomass, Biochar, Bioproducts and Bioeconomy. It can be used independently or as preparation and background material for Moodle-based courses.

Within Moodle, the Learning Suite is now organised into three main categories:

- Courses
  This area contains structured B4C learning offers, especially the Continuing Professional Development course and the Carbon Management course. These courses support participants through programme information, learning resources, links, documentation and photo galleries.
- Self-Learning Courses for Facilitating Teaching and Learning
  This area supports educational professionals who want to design, facilitate and assess B4C-related learning activities. It includes self-learning resources on Competence-Oriented Learning and Validation, the LEVEL5 approach, Design Thinking facilitation and Open Educational Resources.
- Teaching and Learning Material
  This area provides reusable resources for planning, adapting and implementing B4C learning activities. It includes competence frameworks, Design-Based Collaborative Learning and Research resources, STEM teacher guides, subject-specific examples and tools related to Circular Carbon Management Systems.

This structure reflects the different needs of B4C users. Some users enter the Learning Suite through a structured course. Others want to improve their facilitation competences. Others need concrete teaching materials, templates, examples or background content. The WordPress Biochar Course adds a further low-threshold access route for users who first want to explore the thematic content before entering a more structured learning pathway.

The Learning Suite therefore does not function only as a repository of project outputs. It connects structured qualification offers, self-directed professional development, public thematic learning and practical teaching resources. In this way, it supports the transfer of B4C results into vocational education, adult learning, KA1 courses, local sustainability projects and regional Circular Carbon Economy initiatives.

Together, the Moodle Learning Suite and the open-access Biochar Course form a flexible learning ecosystem. They combine thematic knowledge, facilitation methods, competence development, practical materials and project-oriented learning. This supports the main B4C objective: helping learners and educators move from understanding biochar towards practical application, project development and sustainable regional action.

2. Environment 1 – Moodle-based Learning Suite

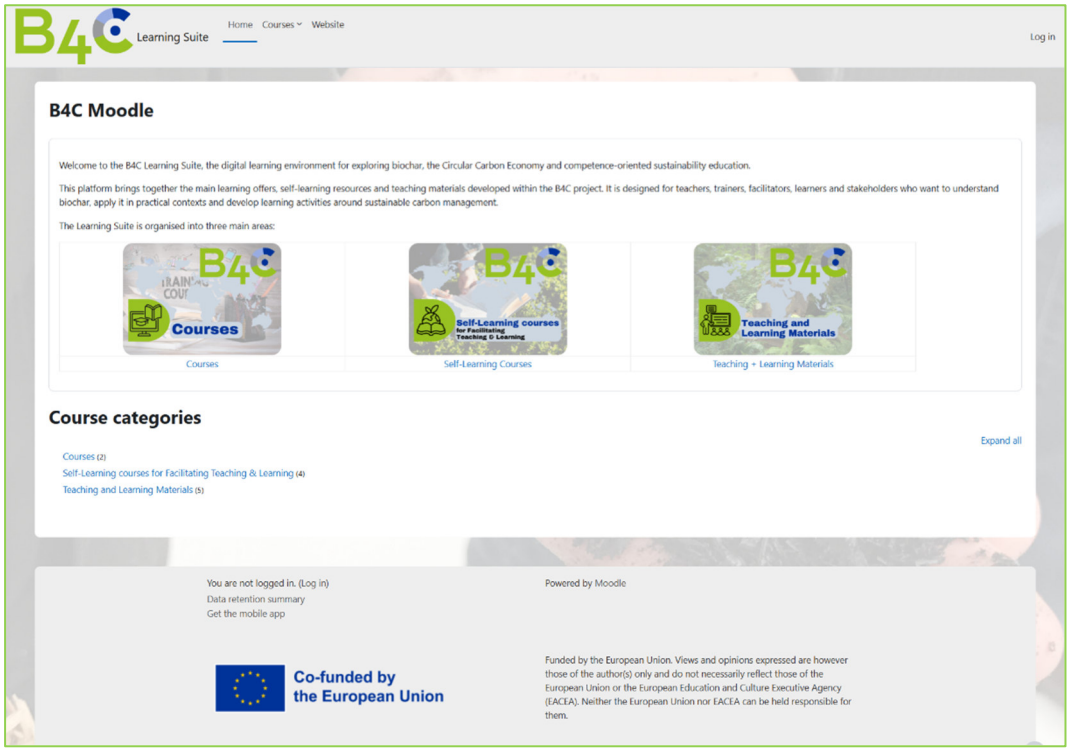
The Moodle-based Learning Suite forms the structured learning, facilitation and resource environment of the B4C Support Hub. It provides access to courses, self-learning modules and reusable teaching materials for educational professionals, trainers, facilitators, VET organisations and other stakeholders who want to work with biochar and the Circular Carbon Economy in learning and development contexts.

The Moodle environment was organised into three main categories:

1. Courses
2. Self-Learning Courses for Facilitating Teaching and Learning
3. Teaching and Learning Material

This structure makes the platform easier to navigate and reflects the different ways in which users may enter the B4C learning ecosystem. Some users participate in a structured course, some want to improve their facilitation competences, and others are looking for concrete materials, templates or examples for their own educational practice.

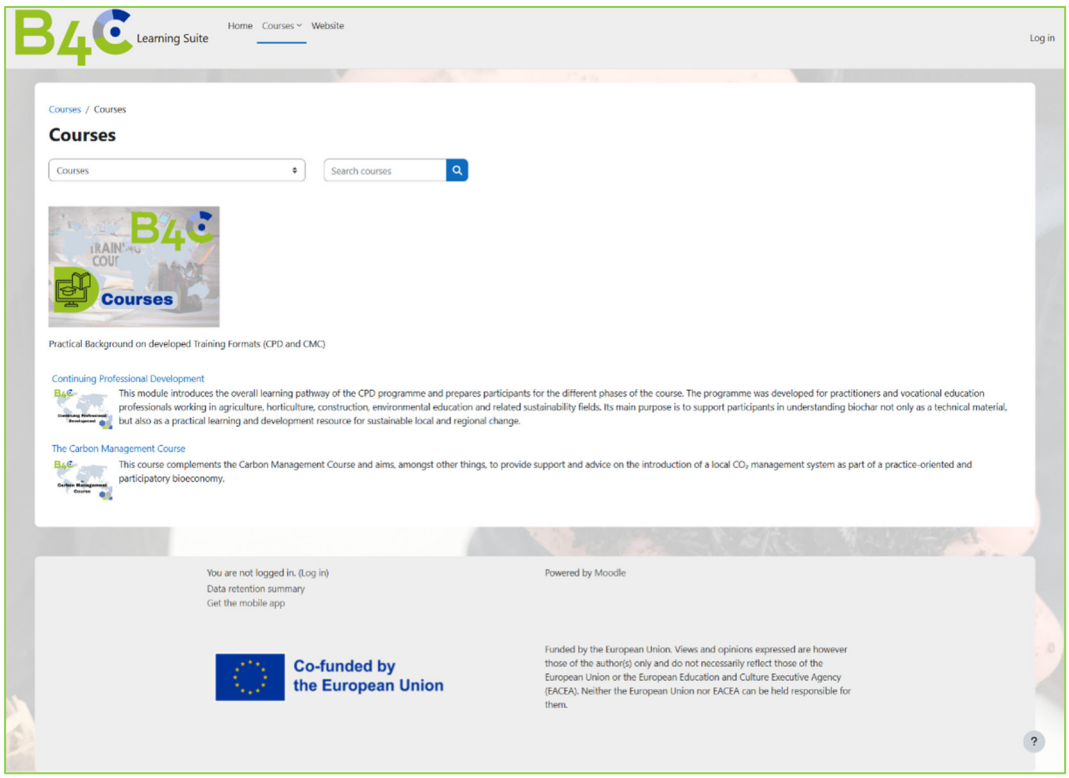
The Moodle-based Learning Suite therefore provides more than course access. It serves as a professional development environment, a resource collection and a transfer space for the B4C methodology.



LMS: Landing Page

2.1.Courses

The category **Courses** contains structured B4C learning offers that were developed, delivered or prepared within the project context. These courses provide organised learning pathways and support participants in engaging with biochar, Circular Carbon Economy and sustainable regional development in a more systematic way.



LMS: Courses

At the current stage, this category includes the following main course areas:

- Continuing Professional Development Programme
- Carbon Management Course

The Continuing Professional Development Programme introduces educational professionals to biochar and the Circular Carbon Economy as learning and development topics. It combines thematic input with methodological guidance, practical examples, collaborative project work and follow-up activities. The course supports teachers, trainers and facilitators in transferring the B4C approach into their own organisations, training offers or local learning projects.

The Carbon Management Course focuses more strongly on regional Circular Carbon Economy implementation. It addresses residual biomass, carbon flows, biochar value chains, regional application scenarios and the development of local or regional carbon management projects. It

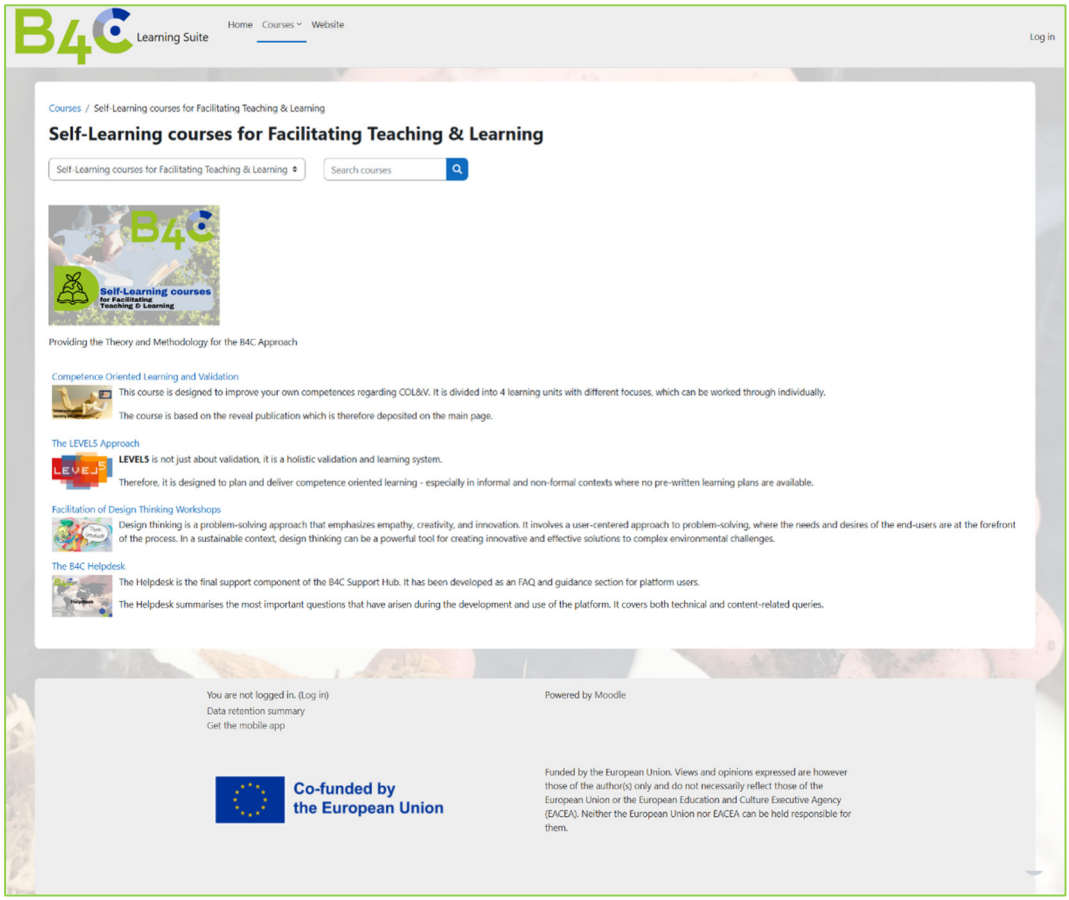
therefore provides a bridge between educational activities and practical implementation in municipalities, regions, farms, businesses or community-based sustainability initiatives.

The course category may include programme descriptions, schedules, links to learning resources, course documentation, photo galleries and follow-up materials. In this way, it documents not only the course content, but also the learning process and practical implementation context.

2.2. Self-Learning Courses for Facilitating Teaching and Learning

The category **Self-Learning Courses for Facilitating Teaching and Learning** supports educational professionals who want to design, facilitate and assess B4C-related learning activities independently.

This category focuses on the methodological foundation of B4C. It helps trainers and facilitators move beyond knowledge transmission towards learner-centred, collaborative and competence-oriented education.



LMS: Self-Learning courses for Facilitating Teaching & Learning

The self-learning area includes the following modules:

- Competence-Oriented Learning and Validation
- LEVEL5
- Facilitating Design Thinking
- Open Educational Resources

The module on Competence-Oriented Learning and Validation introduces the idea that learning should not only focus on knowledge, but also on skills, attitudes and the ability to act in real contexts. This is essential for B4C because biochar and Circular Carbon Economy topics require practical application, cooperation, reflection and project-oriented thinking.

The LEVEL5 module introduces the validation approach used in B4C. It supports participants in understanding competence development across knowledge, skills and attitudes and provides orientation for self-reflection, assessment and documentation of learning outcomes.

The module on Facilitating Design Thinking provides guidance for using Design Thinking as a creative and structured method in B4C learning activities. It helps trainers support learners in understanding challenges, developing ideas, creating prototypes and reflecting on possible solutions.

The Open Educational Resources module supports the use, adaptation and sharing of learning materials. It helps users understand how open resources can support flexible, reusable and transferable learning in the field of biochar and sustainability education.

Together, these self-learning modules strengthen the professional capacity of teachers, trainers and facilitators. They provide the methodological basis for implementing B4C learning activities in different educational and professional contexts.

2.3. Teaching and Learning Material

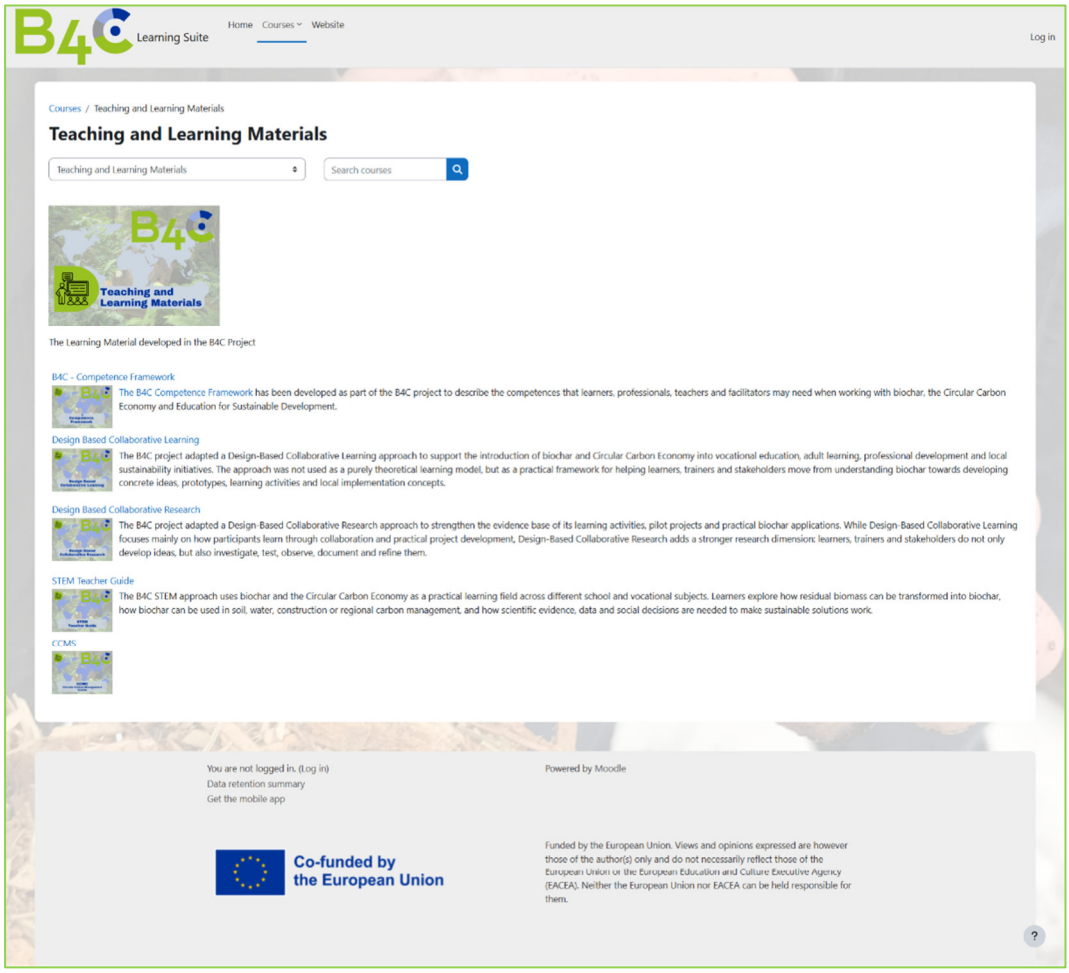
The category Teaching and Learning Material provides reusable resources for planning, adapting and implementing B4C learning activities.

This section is designed as a practical material collection for teachers, trainers, facilitators and course developers. It supports users who already have a learning context in mind and need concrete resources, examples, templates or guidance to design their own B4C-related activities.

The category includes the following material areas:

- Competence Frameworks
- Design-Based Collaborative Learning

- Design-Based Collaborative Research
- STEM Teacher Guide
- Circular Carbon Management System resources



LMS: Teaching and Learning Materials

The **Competence Frameworks** area provides access to the competence models developed in B4C. These frameworks help users define learning outcomes, plan learning pathways and connect learning activities with competence development and validation.

The **Design-Based Collaborative Learning** resources introduce the B4C approach to collaborative, project-oriented and learner-centred learning. They support trainers in designing learning activities where participants work together on practical biochar and Circular Carbon Economy challenges.

The **Design-Based Collaborative Research** resources add a stronger inquiry and evidence dimension. They help users integrate observation, testing, documentation and reflection into B4C learning projects. This is especially useful for activities involving experiments, prototypes, field observations or regional analyses.

The **STEM Teacher Guide** provides subject-specific learning ideas and examples for mathematics, chemistry, biology, physics and social sciences. It helps teachers connect biochar and Circular Carbon Economy topics with subject-based learning activities, cases and tasks.

The **Circular Carbon Management System resources** provide tools and templates related to regional carbon management. This includes tutorial materials, production templates and application templates that support the planning and analysis of carbon management scenarios.

Overall, the Teaching and Learning Material category makes the B4C Learning Suite reusable beyond the original project activities. It allows users to select, adapt and combine resources according to their own educational setting, target group and learning objectives.

3. Environment 2 – Open-Access Biochar Course on WordPress

In addition to the Moodle-based Learning Suite, the B4C Support Hub includes an open-access Biochar Course on WordPress. This course remains an essential part of the overall Learning Suite concept because it provides a low-threshold thematic introduction to biochar and the Circular Carbon Economy.

While Moodle offers structured courses, facilitation resources and teaching materials, the WordPress course is designed for open public access. It can be used by learners, teachers, trainers, students, practitioners, municipalities, businesses, policymakers and interested citizens who want to explore the topic without entering a full learning management system.

The WordPress course introduces the biomass-to-biochar value chain and places it within the wider Circular Carbon Economy. It supports users who are new to the topic and can also serve as preparation or background material for Moodle-based courses, KA1 training offers, project workshops or local sustainability activities.

The course is structured around four interconnected modules:

- Biomass
- Biochar
- Bioproducts
- Bioeconomy

Together, these modules guide users from the origin of biomass to biochar production, practical applications and wider circular carbon systems. The structure follows a clear learning pathway: users first understand the resource base, then the material, then possible products and finally the wider economic and regional system.

In addition to the Moodle-based LMS, the B4C Learning Suite includes an open-access Biochar Course directly integrated into the WordPress environment.

This course provides a thematic introduction to the Circular Carbon Economy and the biomass-to-biochar value chain. It is designed to be accessible for a broad audience, including students, teachers, trainers, practitioners, municipalities, businesses, policymakers and interested individuals.

The open-access format allows users to explore the topic without entering the full LMS environment. It can therefore serve as a first entry point into B4C and as a bridge between public awareness, self-guided learning and more structured training activities.

The course is structured around four interconnected modules:

- Biomass
- Biochar
- Bioproducts
- Bioeconomy

Together, these modules guide users from the origin of biomass to biochar production, product applications and regional Circular Carbon Economy development.


BIOCHAR FOR COMPETENCE DEVELOPMENT FOR THE CIRCULAR CARBON ECONOMY
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Course: Biochar in Construction
Course: Biochar in ornamental Horticulture & Landscape
Course: Biochar in Agriculture
Course: Biochar, Climate Action & Active Participation
FROM BIOMASS TO BIOCHAR
WELCOME TO THE JOURNEY TOWARD A CIRCULAR CARBON ECONOMY BUILT WITH BIOCHAR.
Biochar has the potential to fundamentally change how we work with carbon. Instead of treating carbon as a problem to be eliminated, biochar allows it to be captured, stabilised and put to long-term use — opening new pathways for climate action, sustainable production and regional value creation.
At the heart of this learning platform is the concept of the Circular Carbon Economy. A Circular Carbon Economy focuses on how carbon flows through systems — how it is captured, used, reused and stored — rather than on linear pathways that end in rapid emissions. Instead of "take, use, emit", the goal is to keep carbon in productive use for as long as possible and to align climate protection with economic and social value creation.
This platform is dedicated to unveiling the potential of biochar as a practical tool for Circular Carbon Economy projects. It combines scientific foundations with hands-on approaches, showing not only what biochar is and how it is produced, but also how carbon can be actively managed through biochar-based value chains at local and regional level.
The course is structured into four interconnected modules, each focusing on a different part of the biochar value chain:
Biomass: Understanding residual biomass as a source of carbon
Biochar: Production processes, properties and quality aspects
Bioproducts: Integrating biochar into long-lasting products and applications
Bioeconomy: Developing regional Circular Carbon Economy projects and value chains
Each module consists of several learning units that combine theory with practical examples, reflection tasks and applied tools. Together, they guide you from basic concepts to a systems-level understanding of how biochar can be used effectively and responsibly.
The platform is designed for everyone interested in sustainable practices and biochar — from students and practitioners to farmers, businesses, municipalities, policymakers and curious individuals. No prior expertise is required; you can follow the modules step by step or explore specific topics according to your interests.
By the end of the course, you will understand biochar and its role in carbon management and also have worked through the key steps of developing a locally relevant Circular Carbon Economy project: Turning climate ambition into practical, place-based action.
Let's get started!

3.1.Biomass

The Biomass module introduces residual biomass as the starting point of biochar-based value chains.

Users learn that biomass can include materials such as wood, crop residues, grasses, organic waste, manure or algae. The module explains that biomass is not a uniform resource. Different types of biomass have different properties, and these properties influence the quality, yield, stability and application potential of the resulting biochar.

The module also encourages users to reflect on biomass streams in their own region or everyday environment. This is important for B4C because Circular Carbon Economy learning starts with recognising local resources. Learners are invited to ask where biomass comes from, how it is currently handled, whether it is treated as waste and how it could become part of a more circular carbon system.

In this way, the Biomass module prepares users to understand biochar not as an isolated product, but as part of a regional resource cycle.

3.2. Biochar

The Biochar module introduces biochar as a stable, carbon-rich material produced from biomass under low or no oxygen conditions.

The module explains how biochar properties are influenced by feedstock, production process, pre-treatment, post-treatment and quality requirements. It introduces key aspects such as carbon stability, porosity, mineral content, surface characteristics and safety-related parameters.

This module provides the technical foundation for understanding why biochar can be used in different application fields. It also highlights that responsible biochar use depends on quality, context and purpose. Not every biochar is suitable for every application, and users need to understand the relationship between production conditions, material properties and possible uses.

For B4C, this module is central because it connects basic scientific and technical knowledge with practical decision-making. It helps learners understand what biochar is, how it is made and why its properties matter.

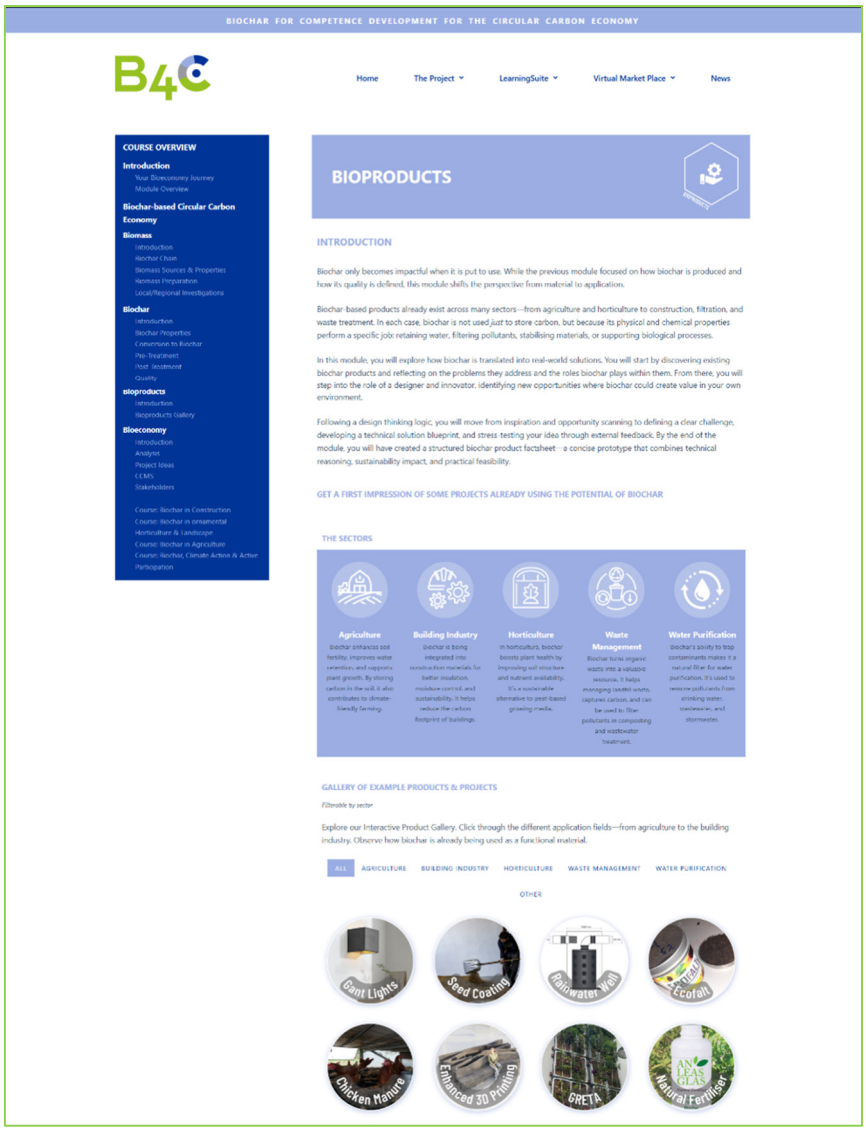
3.3. Bioproducts

The Bioproducts module shifts the focus from biochar as a material to biochar as part of practical applications.

Users explore how biochar can be used in sectors such as agriculture, horticulture, construction, waste management, water purification and other fields. The module presents biochar as a component of solutions rather than as an end in itself.

This design-oriented logic is important for B4C. Learners are encouraged to identify which problem a biochar-based product or application could address. For example, biochar may support soil improvement, water retention, nutrient management, carbon storage, material innovation or resource efficiency.

The module therefore helps users move from “What is biochar?” to “What can biochar do in a specific context?” It supports opportunity spotting, product thinking and project development.



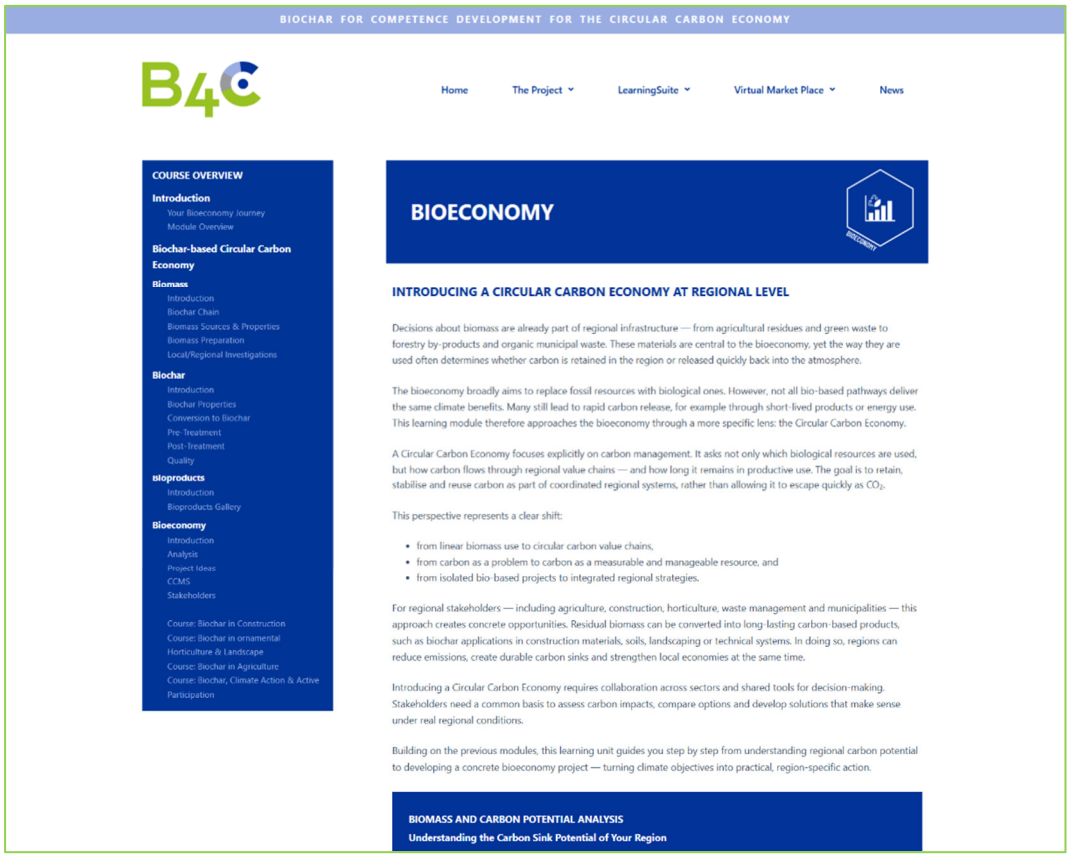
3.4. Bioeconomy

The Bioeconomy module introduces the wider Circular Carbon Economy perspective.

It focuses on how residual biomass, biochar production, product development and regional value chains can be connected in local or regional carbon management strategies. Users are encouraged to think beyond individual products and to consider the wider system of actors, resources, carbon flows and application opportunities.

This module is especially important because biochar projects rarely work in isolation. A successful biochar-based Circular Carbon Economy may involve biomass suppliers, production facilities, municipalities, farmers, construction actors, educators, researchers, businesses and community initiatives.

The Bioeconomy module therefore helps learners understand how biochar can become part of regional development, climate action and circular value creation. It also creates a bridge to the Moodle-based Carbon Management Course, the Virtual Marketplace and the B4C project-development resources.



4. Role of the WordPress Course within the Learning Suite

The WordPress Biochar Course plays a complementary role within the B4C Learning Suite.

It provides open access to the thematic foundation of B4C and can be used in several ways:

- as a first introduction for users who are new to biochar;
- as preparation for Moodle-based courses;
- as background material for teachers and trainers;
- as self-learning material for learners and interested citizens;
- as a resource for KA1 courses and workshops;
- as a bridge between public awareness and structured professional development.

The open-access format increases the visibility and usability of the B4C results. It allows users to engage with the topic without requiring login, registration or participation in a formal course. At the same time, it remains connected to the Moodle Learning Suite, where users can find structured training pathways, facilitation materials, competence frameworks and teaching resources.

The WordPress course therefore strengthens the overall B4C Support Hub by making the thematic content accessible, reusable and transferable.

5. Added Value of the Integrated Learning Suite

The added value of the B4C Learning Suite lies in the combination of structured courses, self-learning opportunities, reusable teaching materials and open-access thematic content. The Learning Suite does not only provide information about biochar and the Circular Carbon Economy. It creates a flexible digital learning ecosystem that supports different user groups and different levels of engagement.

The Moodle-based Learning Suite provides the structured and methodological part of the system. It supports educational professionals, trainers and facilitators who want to plan, deliver and assess B4C-related learning activities. Through the categories Courses, Self-Learning Courses for Facilitating Teaching and Learning, and Teaching and Learning Material, users can access complete training offers, methodological self-learning modules and practical resources for their own educational work.

The open-access WordPress Biochar Course complements Moodle by providing a low-threshold entry point into the thematic content of B4C. It allows users to explore biomass, biochar, bioproducts and bioeconomy without needing to register for a structured course. This makes the B4C topic accessible to a wider audience, including learners, teachers, practitioners, municipalities, businesses, policymakers and interested citizens.

Together, both environments support the main objective of the B4C Support Hub: to help users move from awareness and understanding towards practical application, project development and sustainable regional action.

The integrated Learning Suite connects:

- structured CPD and Carbon Management courses;
- self-learning modules for facilitation and competence-oriented teaching;
- methodological approaches such as COL&V, LEVEL5, Design Thinking, DBCL and DBCR;
- competence frameworks and validation tools;
- STEM teaching materials and subject-specific examples;

- Circular Carbon Management System resources;
- open-access thematic content on biomass, biochar, bioproducts and bioeconomy;
- project examples, templates and reusable learning resources.

This structure supports several pathways through the B4C results. A trainer may enter through the CPD course and then use the teaching materials for their own learners. A teacher may start with the STEM guide and later explore the WordPress Biochar Course as background material. A stakeholder interested in regional implementation may begin with the Bioeconomy module and then continue with Carbon Management resources. A facilitator may use the self-learning modules to strengthen their competence in learner-centred, collaborative and competence-oriented education.

The Learning Suite therefore increases the transferability of the B4C project results. It allows different users to select, combine and adapt resources according to their own context. This is especially important because B4C addresses diverse sectors such as agriculture, horticulture, construction, environmental education, vocational training, adult learning and regional development.

Another added value is the connection between content and methodology. Biochar and the Circular Carbon Economy are not presented only as technical topics. They are linked to facilitation methods, collaborative learning, research-oriented inquiry, competence development and practical project work. This helps educators transform complex sustainability topics into meaningful learning activities.

The Learning Suite also supports long-term exploitation beyond the project lifetime. It can be used for B4C follow-up activities, KA1 mobility courses, local workshops, VET training, adult education, regional development projects and awareness-raising activities. Because the structure is modular, new resources, course materials, project examples and teaching tools can be added over time.

Overall, the B4C Learning Suite represents a central digital output of the project. It brings together the knowledge, methods, tools and materials developed during B4C and makes them accessible for future learning, facilitation and implementation. Its main strength is the integration of open thematic learning, structured professional development and practical teaching resources into one coherent support environment.