Year 2 Accelerator Activity and Monitoring Report

BIO BOOST
Bioeconomy projects accelerator

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PROJECT INFORMATION

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Table of Content

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List of tables

List of figures

0. Executive Summary

This report presents the activities and results of the Bioboost Accelerator during its second year of operation (June 2023 – May 2024). The Accelerator's main goal is to help circular bioeconomy projects in Catalonia become investment-ready, by offering free and tailored Project Development Assistance (PDA) services.

Objective of the report

The aim of this report is to **monitor and evaluate the performance of the Accelerator**, with a focus on the results achieved during Year 2. It provides both a narrative summary and a quantitative update through key performance indicators (KPIs).

Readers will find:

1. **An updated Accelerator methodology**, refined based on lessons from the first projects.
2. **A recap of activities**, including services delivered, projects supported, and progress across the 10 Bioboosters.
3. **Key lessons learnt**, highlighting common barriers and the added value of systemic, place-based approaches.
4. **Monitoring data (KPIs)**, assessing the performance and effectiveness of the Accelerator.

Year 2 highlights

During this second year, the Accelerator received ten new applications through its open call, reflecting a continued interest in the PDA services. Five of these initiatives were formally onboarded as new Bioboosters, joining the five that were already active from the first year. However, three projects were later discontinued, resulting in seven Bioboosters remaining under active development by the end of the period.

In total, more than 40 services were delivered, covering a wide range of areas including technical analysis, business planning, legal and regulatory support, and facilitation. Two projects advanced significantly towards investment-readiness, while others made progress in terms of feasibility studies and stakeholder coordination.

Notably, Biobooster 4 (the wool processing plant) is nearing completion. Although during this second year no project has been formally closed yet, the overall maturity of the Bioboosters has improved significantly, setting the stage for a pipeline of investable projects in Year 3. Satisfaction among project promoters remains high, confirming the effectiveness of close facilitation and personalised support.

1. Introduction

The Bioboost project is an EU-funded initiative that supports the development of circular bioeconomy projects in Catalonia. Its main goal is to mobilise €30 million in investment by helping local initiatives become technically, financially, and legally viable.

To achieve this, the project operates an Accelerator Office, which acts as a one-stop shop for Project Development Assistance (PDA). The Accelerator provides support in four key areas:

- Facilitation and coordination
- Technical feasibility
- Legal and regulatory guidance
- Business and financial planning

Each supported project, called a Biobooster, receives a personalised service package based on its needs and level of maturity. The Accelerator helps move projects forward—from initial ideas to viable investment cases—by working closely with promoters, stakeholders, and the financing community.

The Bioboost project also contributes to the broader Catalan and European bioeconomy agendas by:

- Engaging with investors and public institutions to overcome systemic barriers,
- Developing replicable methodologies and tools,
- Strengthening collaboration between sectors and territories.

This Year 2 report documents the progress made in implementing the Accelerator and supporting Bioboosters, while also capturing lessons learnt and updating key indicators that reflect the impact and performance of the project.

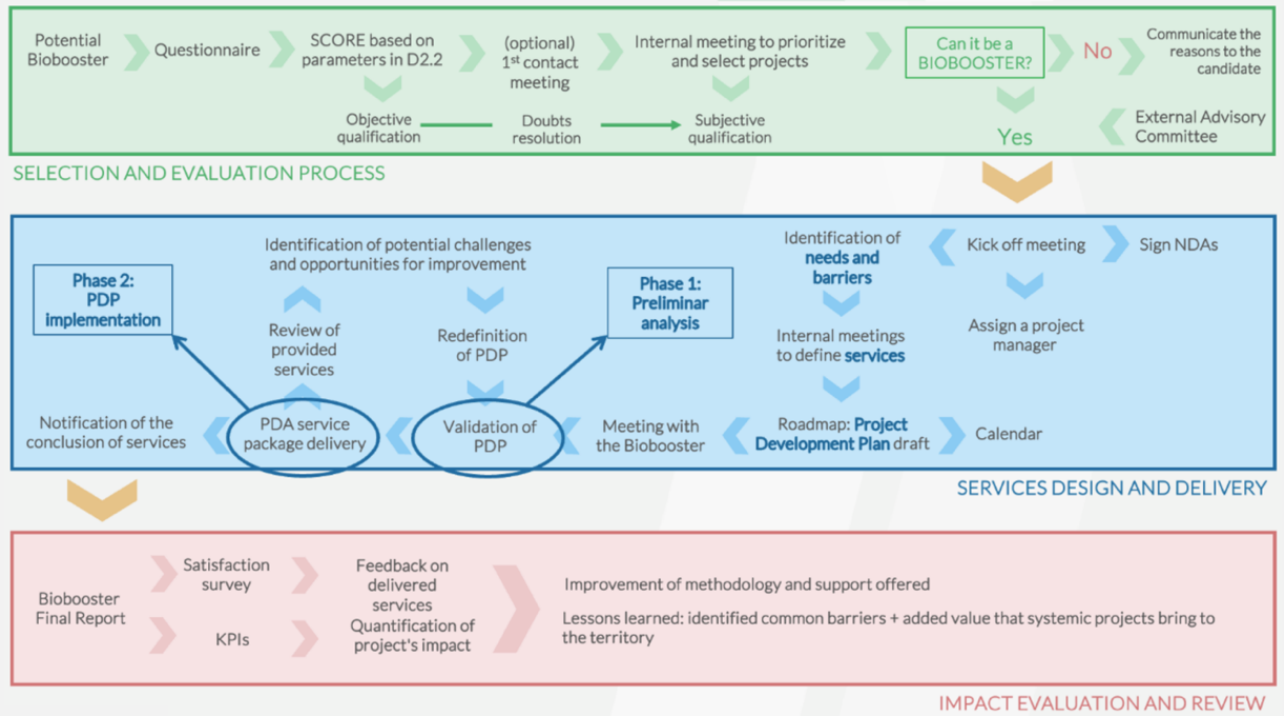
2. Methodology

The Bioboost Accelerator methodology defines how projects are selected, evaluated, supported, and monitored throughout their development. It was first outlined in the D3.1 report and is based on the Circular Cities and Regions Initiative (CCRI) framework. It combines a selection and evaluation process with personalised Project Development Assistance (PDA), and continuous impact monitoring.

2.1. Methodology improvements in the second year

The methodology has been refined during the second year to better reflect the operational realities of the Accelerator and improve alignment between project needs, service design, and available resources.

Figure 1. Last version of Bioboost project Accelerator methodology[1]



[1] Source: elaborated by the author

Biobooster's selection and evaluation process

The Accelerator launched a second open call during Year 2. Interested projects filled in a questionnaire, and a scoring system (developed in D2.2) was used to evaluate them based on maturity, investment potential, and circularity.

A new step introduced this year was the first contact meeting with most candidates. These meetings helped clarify doubts and gather more detailed information. After that, the Bioboost team met internally to review each case, combining the score with a more general assessment of the project's potential.

Projects that were seen as strong candidates were then presented to the External Advisory Committee (EAC), which gave feedback and confirmed whether the project should become a Biobooster.

This updated process ensures that selected projects are both promising and aligned with the goals of the Accelerator.

Biobooster's service design and deliverly

Once selected, each Biobooster starts with a kick-off meeting, where a non-disclosure agreement (NDA) is signed and a project manager is assigned. The team then gathers more details about the project to understand its needs and possible barriers.

An internal meeting is held to define the support plan. This results in a Project Development Plan (PDP), which lists the services to be offered and a basic timeline. The PDP is then reviewed and confirmed with the project promoter.

After that, the PDA services are delivered. These may include support in regulation, technology, business planning, or facilitation. Services are adapted along the way if needed, depending on how the project progresses.

One improvement introduced this year was to keep the PDP flexible and make regular updates when needed.

Biobooster's impact evaluation and review

When the support process ends, a final report is prepared to summarise results, challenges addressed, and lessons learnt. The promoter is also asked to fill out a satisfaction survey to evaluate the services received.

In addition, Key Performance Indicators (KPIs) are used to measure the project's contribution in areas like resource use, waste reduction, innovation, and collaboration. These results help us improve the methodology and understand the value of the projects supported.

2.2. Progression of Accelerator's activities and focus areas

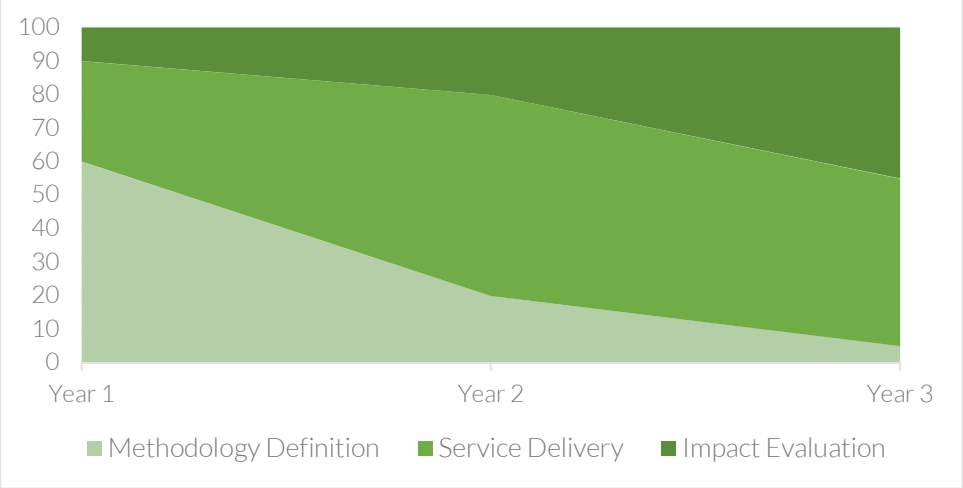
The focus of the Accelerator has evolved over time. In Year 1, the priority was to define and test the methodology: setting up selection criteria, designing the Project Development Assistance (PDA) services, and establishing a basic framework for evaluating impact. While initial services were delivered, the main goal was to adjust the process based on early feedback.

Table 1. Activities planned for each year of the Accelerator

Activity/Year	Year 1	Year 2	Year 3
Methodology Definition	Defining and refining methodology	**Implementing methodology to Bioboosters**	Methodology validation and refinement
Service Delivery to Bioboosters	Initiating service delivery	**Continued service delivery and evaluation**	Completion of service delivery
Impact Evaluation and KPIs	Evaluating impact of first Biobooster	**Refinement of impact analysis and KPIs**	Measurement of impact and KPIs

In **Year 2**, the methodology was fully applied to a growing number of Bioboosters. Although still open to small refinements, the main focus shifted to **service delivery**, ensuring that the projects received relevant and high-quality support. Lessons learnt from Year 1 helped strengthen internal coordination, improve planning, and better adapt services to the specific needs of each project. This second year also marked the beginning of a more structured approach to **impact evaluation**.

Figure 2. Weight of the Accelerator's activities



This progression reflects a natural shift from framework development to full-scale implementation and monitoring, with Year 3 expected to focus on consolidating outcomes and measuring long-term results.

3. Accelerator activities during 2nd year

3.1. Overview

During the second year of the Bioboost Accelerator, the focus moved from refining the methodology to applying it more effectively, improving service delivery, coordination, and progress tracking. Key activities included:

- Launch of a second open call for projects (Summer 2024)
  → Attracted a wider range of candidates in terms of project types and territorial scope, helping diversify and strengthen the Biobooster portfolio.

- Improved project selection process
  → Combined questionnaire scoring with short introductory meetings to better understand each proposal.
  → Internal evaluations were followed by validation from the External Advisory Committee (EAC).

- Refinement of Project Development Plans (PDPs)
  → Included clearer timelines, defined actions, and detailed service descriptions.
  → Helped align expectations and ensure smooth collaboration between the Bioboost team and project promoters.

- Regular follow-up meetings with Biobooster managers
  → Enabled early detection of challenges, quick adjustments, and better coordination across the portfolio.

- Implementation of a time-tracking system per Biobooster
  → Improved resource management and helped ensure services were delivered within planned limits.

- Focus on delivering targeted and well-defined services
  → Avoided unnecessary support extensions, helped projects progress faster, and maintained the Accelerator's agility.

- Closure process for completed Bioboosters
  → Included a final meeting with the promoters to review outcomes and lessons learned.
  → A final report was prepared for each project to document results and guide future action.

- Advancement of impact assessment work
  → A full impact evaluation was completed for Biobooster 2 – Alcarràs, covering environmental, social, and economic dimensions.
  → Impact assessment for Biobooster 4 – Wool Plant is currently underway.
  → The KPI framework defined in Year 1 is now being progressively applied, laying the foundation for more systematic impact tracking in Year 3.

To visualise the status of each Biobooster, table below presents an overview of their progress across the three phases of the methodology. Colour coding indicates status:

= abandoned

= completed

= still in progress

Table 2. Overview of Biobooster's progress in the 2nd year of the Accelerator

	SELECTION AND EVALUATION PROCESS				SERVICE DESIGN AND DELIVERLY						IMPACT EVALUATION AND REVIEW		
	Questionnaire	Internal meeting	EAC meeting	Accepted as a Biobooster	KoM	Sign NDA	Assign a project manager	Roadmap / Project Development Plan	PDA / service package	Conclusion of PDA services	Final report	Impact review (KPIs)	Satisfaction survey
Biobooster 1 - Coopirenaica	+	+	+	+	+	+	+	+	+				
Biobooster 2 - Alcarràs	+	+	+	+	+	+	+	+	+	+	+	+	+
Biobooster 3 – Casa Ametller	+	+	+	+	+	+	+	+	+				
Biobooster 4 – Wool plant	+	+	+	+	+	+	+	+	+	+	+	+	
Biobooster 5 – Protein plant	+	+	+	+	+	+	+	+	+				
Biobooster 6 – Plana de Vic Cooperative	+	+	+	+	+	+	+	+	+				
Biobooster 7 – Compost Segrià	+	+	+	+	+	+	+						
Biobooster 8 – Insectius	+	+	+	+	+	+	+						
Biobooster 9 – Labin Products	+	+	+	+	+	+	+	+	+				
Biobooster 10 - Ecotros	+	+	+	+	+	+	+	+	+				

The following section provides an overview of the work carried out by the Accelerator during Year 2, according to the three main methodological phases: selection and evaluation, service design and delivery, and impact assessment:

Selection and evaluation process

The selection process in Year 2 built on the approach developed in Year 1, with the goal of improving how potential Bioboosters are evaluated and onboarded. While the core methodology remained the same—combining a questionnaire and internal scoring—the process was strengthened with two key additions:

- First-contact meetings were held with most candidates to better understand the maturity, needs, and feasibility of each project before making a final decision.
- Each candidate was reviewed by the External Advisory Committee (EAC), which helped validate the project's strategic relevance and confirm whether it should be accepted as a Biobooster.

This more complete assessment approach allowed for better project selection and more realistic planning of service needs.

Although the initial goal of mobilising €30 million in investment was not yet reached, the Accelerator remains committed to supporting both high-investment projects and smaller initiatives with strong circular economy potential. Supporting projects with quicker paths to implementation—even if smaller in size—is now considered a strategic part of the portfolio.

Out of the 20 potential Bioboosters assessed:

- **10 projects were accepted** into the Accelerator as Bioboosters.
- **3 of these accepted projects were later suspended** or paused and did not move forward.
- **7 projects were rejected** due to low maturity, lack of relevance, or service incompatibility.
- **1 project was deferred** to a later stage due to limited readiness.
- **2 projects remain under evaluation**, pending final internal review and a decision from the EAC.

The reasons for rejection or postponement varied and included low project maturity, unclear TRL levels, lack of contact information, or overlaps with existing Bioboosters.

This table provides an overview of all candidates, including their scores, evaluation decisions, current progress status, and the reasoning behind each outcome.

Table 3. Potential Bioboosters questionnaire results and status

	Potential Biobooster	Brief description of the project	Score from questionnaire	Evaluation Status	Progress Status	Reasons
1	Coopirenaica	Biogas production using local livestock manure	8.54	Accepted as Biobooster 1	Suspended	Accepted with support from the EAC. Regionally strategic, but currently inactive due to lack of promoter follow-up.
2	Alcarràs Bioproductors SAT	Biogas and biofertiliser production from livestock waste.	8.97	Accepted as Biobooster 2	Finished	High systemic impact and strong local relevance. Successfully completed with full support from the EAC.
3	Timberlab	Bioconstruction materials using local wood.	3.27	Rejected		Financing service already explored. Low relevance to the bioeconomy. Low systemic impact.

4	Casa Ametller	Agro-park combining food production, energy recovery, and waste valorisation.	8.93	Accepted as Biobooster 3	Ongoing	Accepted with support from the EAC. Strategic relevance and investment scale justified support.
5	Alere Circular	Biofertiliser production from manure streams.	6.17	Rejected		Low maturity and untested technology. Services already explored in the same sector and region.
6	Wool processing plant	Valorisation of sheep wool.	5.67	Accepted as Biobooster 5	(Nearly) Finished	Accepted with support from the EAC. Approved due to its strong systemic impact despite modest investment scale.
7	EPACAT – Protein Plant	Open-access facility for scaling up alternative protein production.	8.27	Accepted as Biobooster 4	Paused	Accepted as strategic infrastructure project with the potential to support the scaling of alternative protein initiatives. However, the project was paused due to external political decisions, which blocked further advancement despite its technical viability and regional interest.
8	Segrià Compost SA	Composting of organic waste and agri-food by-products.	7	Accepted as Biobooster 7	Suspended	Accepted with support from the EAC. However, the project is currently suspended following a strategic decision by the promoter and their investors. No PDA services were delivered.
9	Plana de Vic Cooperative	Cooperative-led biogas and nutrient recovery system.	7.23	Accepted as Biobooster 6	Ongoing	Accepted with support from the EAC. Ongoing collaboration. Services aligned with existing efforts in the territory.
10	Inoït SL	Nanovector technology using food by-products.	4.87	Rejected		Low TRL and insufficient project maturity for service delivery.
11	Napros SL	Production of alternative protein from insects	3.70	Rejected		No contact information provided; unable to evaluate or follow up.
12	Labin Products SL	Production of bio-based fertilisers and peptide-rich biostimulants.	4.73	Accepted as Biobooster 9	Ongoing	Accepted with support from the EAC. Potential for innovation in the fertilizer sector. Fits within the regional bioeconomy context.
13	Insectius	Production of proteins using mealworms and black soldier flies.	5.90	Accepted as Biobooster 8	Ongoing	Accepted with support from the EAC. Accepted due to its circular model and local innovation potential. Opportunity to explore regulatory support.
14	Archroma Iberica SL	Uses wool waste as a raw material for producing dyes.	6.27	Rejected		Some of the required services are outside of our expertise.
15	Penedes-Garraf Mancomunity	Organic waste and biomass valorisation for local energy production.	8.03	Rejected		Project scope too broad; requested services do not align with Bioboost's offer.
16	Envall Cooperative	Thermal insulation materials made from natural wool.	4.87	Rejected		Very similar to the wool Biobooster already supported; not selected for duplication reasons.

17	Ecotros	Local composting by combining organic waste with forest biomass to improve soil health and close nutrient loops	5,80	Accepted as Biobooster 10	Ongoing	Accepted due to strong territorial fit and replication potential in local bioeconomy.
18	Chlydro	Microalgae-based biomass production and wastewater treatment.	6,4	Deferred to later stages		Interesting potential, but low TRL and unclear business model. Not yet ready for support.
19	Crinatur Energy	Large-scale bioenergy system combining anaerobic digestion and gasification.	8,07	Still under revision		High complexity: high investment needed; interesting concept but not ready for Bioboost services at this stage; potential for future phase.
20	Fungi Farmers	Urban mushroom cultivation using spent coffee grounds.	4,23	Still under revision		Very early-stage; project not established in Catalonia.

Service design and delivery

During the second year of operation, the Accelerator focused on delivering more targeted and effective services to the active Bioboosters. Building on the experience from Year 1, the team refined its approach by expanding the range of available services and adapting them more precisely to the specific needs and maturity level of each project. These services included technical assistance, facilitation, impact mapping, circular economy support, legal and administrative services, and business and financing services. In addition to these, special focus was given to optimizing project management, ensuring efficient progress tracking, and providing regular support through updated PDPs.

The following table summarises the relative importance of each service type for the different Bioboosters. These assessments are based on the actual time, effort, and strategic relevance of each support area.

Table 4. Recap of importance of serviced delivered for each Biobooster

	Facilitation / Mapping	Technical	Administration and legal	Business and financing
Biobooster 1 – Coopirenaica	high	medium	low	high
Biobooster 2 – Alcarràs	high	medium	high	high
Biobooster 3 – Casa Ametller	medium	high	low	high
Biobooster 4 – Wool plant	high	low	medium	high
Biobooster 5 – Protein plant	low	low	high	high
Biobooster 6 – Plana de Vic Cooperative	medium	high	medium	low

Biobooster 7 – Compost Segrià	(no services delivered)	(no services delivered)	(no services delivered)	(no services delivered)
Biobooster 8 – Insectius	low	low	high	low
Biobooster 9 – Labin Products	high	low	low	low
Biobooster 10 - Ecotros	high	medium	high	high

Impact evaluation and review

In Year 2, the Accelerator began applying a more complete approach to evaluating the impact of its services. This means that, in addition to the **qualitative feedback** (satisfaction survey) already applied in Year 1, a **quantitative impact assessment** was introduced to measure environmental, economic, and social outcomes. More details about the impact assessment methodology in section 5 of this report.

For Biobooster 2 (Alcarràs) a full quantitative impact assessment was carried out by an external expert. The results, now integrated into the final report, provide an example of how to structure future evaluations and set a reference for environmental and socio-economic impact measurement across the project. More details in section 3.2. of this report.

The support process for Biobooster 4 (Wool Plant) was nearly completed during this period. The final report is currently being prepared, and an impact analysis is underway to quantify outcomes such as resource recovery, territorial contribution, and circularity performance. As part of the closure process, a satisfaction survey will be shared with the promoters once the final report is completed, to assess the usefulness of the services delivered and the quality of collaboration throughout the process. More details in section 3.2. of this report.

3.2. Biobooster engagement activities

This section focuses on detailing the activities related to engaging with each Biobooster during the second year. It includes descriptions of the specific tasks, interactions, and support provided to individual Biobooster projects.

Biobooster 1: Coopirenaica

Description

Project description

Location: Alt Urgell region, Lleida, Catalonia.
Stakeholders: Coopirenaica (agricultural and farmers' cooperative), Cadí (farming and dairy production cooperative), Peusa group (local power & gas distribution company, with renewable power generation assets).

Objectives:

- Need of efficient and circular management and valorisation of livestock manure and slurry and other agro-industrial waste.
- Production of renewable energy to be used for local industry/transport.
- Preparation of proposal for dimensioning of the plant, business model, and necessary investment.
- Maximise systemic impact.

Needs and barriers identified

- Lack of expertise to select the best biotechnology/valorisation process and corresponding dimension.
- Financing sources unclear, investment structure unclear.
- No business plan.
- Storytelling to cooperative members: How to present the project so that they want to implement it?
- Strong reluctance to implement innovative solutions and to large investments.
- Complexity of administrative procedures.
- Urban planning, location of the facilities.

Potential services to offer – roadmap

Strategic plan in 2 phases:

- Phase 1:
  - Phase with few stakeholders
  - Valorisation of agri-waste from Coopirenaica's cooperative, production of biomethane, and fertilizer production.
  - Evaluation of suitable biotechnologies and sizing of the project.
  - Evaluation of investment needed and preliminary investment structure.
  - Preliminary business model.
- Phase 2: maximizing systemic impact
  - Consider other inputs: municipal organic waste, sawdust, forests.
  - Consider other outputs: biochar, ammonium sulphate, dairy serum.

PDA services and outcomes

Offered services

Facilitation:

- Construction and preparation of the story as a communicative instrument based on the chosen proposal/project.
- Mapping of systemic impact potential using surplus resources:
  - Evaluation of the potential for systemic impact beyond the core of the project (use of livestock manure).
  - Opportunity approach: synergies within existing metabolism
  - Calculation of savings/benefit potential for each opportunity
  - Detection and mapping of the main actors within the different opportunities detected.
- Evaluation of the different monitoring indicators of systemic impact and system of prioritization of the different opportunities, facilitating autonomy for the project promoters in making long-term decisions
- Technical, economic, environmental and social feasibility of the opportunities detected.
- Systemic impact: social, economic and environmental impact of detected opportunities.

Technical:

Proposal of anaerobic digestion plant for the valorisation of the dejections taking into the account the feedstock available (2 scenarios were evaluated). For that purpose, the stages followed are:

- Evaluation of the generated substrate: quality of the substrate
  - Number of farms and cows/farm: As a cooperative, not all farms are willing to participate in the initiative. This fact conditions the amount of available substrate.
  - Tones of cow slurry and cow manure produced (annual production per type and farm).
  - Characteristics of the slurry and manure: dry matter (DM, %) and organic content (ODM, %)
- Evaluation of the substrate quantity and energy production
  - Taking into the account the production (daily or annual) and the quality of the substrate, the biogas and methane production are calculated.
- Determination of the biogas parameters
  - Expected biogas and methane yield allows to estimate the energy produced in MWH/year
- Determination dimension of the anaerobic digestion plant:
  - Quantity of digester, diameter per digester, gross volume per digester, net volume per digester, surface area base plate per digester, total gross volume, total net volume, total surface area base plate.
  - Operational parameters such as calculated fermentation in days, expected organic loading rate in the main digester, expected digester-feed dry matter content, expected digester-average dry matter content and expected organic dry matter reduction.
- Energy balance: Through this analysis it is possible to estimate the energy produced and the one consumed in the plant, obtaining the net energy produced to be used as a resource (biogas).
- Economic proposal: An estimated CAPEX for the prosed biogas pilot plant has been calculated.

Business and Financing:

- Support in the biotechnologies analysis to choose the best option based on feedstock availability and techno-economic analysis.
- Circular business model development.
- Sensitivity analysis: different feedstock prices vs. Energy price.
- Sensitivity analysis: CAPEX vs. quantity of feedstock.
- Financing options (private equity and debt, and public funding).
- Investment structuring.
- Support in story-telling building to motivate the cooperative members to implement the project.
- Support in analysis of potential systemic impacts.

Legal and Administrative:

- Initial identification of the environmental intervention regime applicable to the activity (environmental authorization or license).
- Approach of the requirement of other administrative permits, based on specific environmental factors related to the facilities and processes of the activity (e.g., atmospheric emissions authorization, wastewater discharge permit, etc.).
- Identification of territorial, urban planning, and landscape aspects for the implementation of the activity.
- Analysis of the legal requirements for the production and use of biogas.
- Legal assessment of the possibility of use and management of digestate as an agricultural application.
- Study of corporate issues related to project structuring and legal aspects concerning financing operations in banking or other matters.
- Prior recommendations on industrial property rights and in the selection of technological solutions and cybersecurity measures

Outcomes & results

Bioboost provided the services described above, and after completing phase I of the project, **the project developers decided not to move forward with the project**, therefore the Biobooster was **suspended**.

Bioboost provided a preliminary technical feasibility study including technology evaluation and sizing of the project, and a preliminary financial feasibility study including description of costs, investment needed, preliminary business model, and key financial KPIs. Bioboost also assessed other potential sources of biomass from other stakeholders that would enhance the project's systemic impact.

The results of these assessments were showing high potential for the project implementation, and the project was showing preliminary interest from investors.

However, some of the barriers that were detected from the early stages of the project were not overcomed, mainly the strong reluctance to implement innovative solutions that need large investments. Project developers also did not want to include in the project external investment sources and were reluctant to involving external stakeholders to enhance project's systemic impact.

Biobooster 2: Alcarràs Bioproductors

Description

Project description

Alcarràs Bioproductors is an association (Agrarian Transformation Society - ATS) of 150 farming families (600 farms) in the cattle and pig sector of the municipal area of Alcarràs, coming together to collectively manage the waste from their farms. They acquire 50 hectares of land, were the first Biopark in Catalonia will be located. They have a composting plant, and they are planning to allocate a biogas plant and an open-access industrial pre-scale plant for the validation of biotechnologies and products, along with other technologies and businesses related to bioproducts, biomaterials, and bioenergy.

- Composting plant using livestock waste and vegetative residues from agricultural operations.
- Biogas plant from livestock waste (slurry, manure, etc.).

Their initial project was to use the biogas only to produce electricity and use the digestate to produce compost.

Needs and barriers identified

The following barriers were identified:

- Complexity of administrative procedures to obtain construction permits, difficulty in being declared as a strategic business project, etc.
- Lack of capacities/vision to connect with other projects in the area (and other sources of organic resources) to address the viability of biogas and fertilizer utilization.
- Reluctance to high investments and losing power/shares in the process of introducing external investors into the process.
- No clear business case, ambiguous value proposition, low market size.

Potential services to offer – roadmap

From Bioboost, the objective is to propose innovative technological solution to maximise the use of resources, maximise systemic impacts, create new business models for the primary producers in order to diversify and enhance their agricultural incomes.

PDA services and outcomes

Offered services

Facilitation:

Support in the definition of the business model of the biogas plant complementary to the production of electricity production: tractor filling station and creation of a market for fertilizers

- Exploration and facilitation of market access for liquified biogas, with a specific focus on its utilization to power tractors.
- Exploration and facilitation of market access to sell for high quality soil amendments and biofertilizer, ensuring a continuous market presence for the produced compost, even during off-season periods.
- Exploration and facilitation of market access for ammonium sulphate, a byproduct of the composting process.
- Proposal of strategies for an effective utilization of water derived from the digestate.
- Proposal connections with other projects in the area, fostering a collaborative ecosystem.
- Collaboration to establish a shared connection to the electrical grid.
- Exploration of the potential generation of methane and sharing gas connections with existing facilities and consideration expanding the digestion plant for gas production.

Technical:

Analysis of the technical proposal for the biogas plant, focused on the valorisation of livestock dejections (slurry and manure) through anaerobic digestion.

- Evaluation of alternative scenarios to increase the biogas production: Alcarràs Bioproductors biogas plant which will be installed in their facilities is based on 2 digesters to be feed with the current production (tons/year) of dejections (slurry and manure). An evaluation of other potential feedstocks located near to Alcarràs Bioproductors allows the definition of 2 possible alternative scenarios for maximising the biogas production.
    - Scenario 1: Use of FORM.
    - Scenario 2: Use of agro-food waste.
- Consider other valorisation technologies apart from anaerobic digestion (e.g. pyrolysis for non-fermentable waste).
- Support in the business model of the biogas plant complementary to the production of electrical energy.
- Support in the valorisation of organic fertilizer: search for potential market.

Business and Financing:

Support in the biotechnologies analysis to choose the best option based on feedstock availability and techno-economic analysis.

- Analysis of potential new business models, new markets, that can be integrated into their initial project to enhance systemic impact and increase and diversify primary producers' incomes.
- Circular business model development according to different scenarios (sale of electricity, liquefied or compressed natural gas, prices of feedstock).
- Integration of primary producers in the value chain and business model.
- Building of 4 business model scenarios considering different valorisation routes, end-products, sources of revenue, and investment needed.
- Financing options (private and public).
- Investment structuring.

Legal and Administrative:

- Comprehensive legal advice in the entire procedure to obtain the grid connection permit for the biogas plant. This task includes a legal analysis of the conflict with Serosense, the electric company, distributor and seller of electricity, as well as the preparation of a draft of allegations to the conflict with Serosense and a document accepting the technical part and the quotation provided by Serosense.
- Assistance in all the procedure to secure the IDAE's grant (Program of incentives for singular pilot projects for energy communities) of and amount of 401.400,00€. It involves the interlocution with the Administration and the preparation of a document to request an extension of the deadline established in the grant's resolution of August 2022 to execute the Project in a period of 14 months. The 14-month deadline could not be met due to the Town Hall's delay in issuing a decision on Special Urban Development Plan. Finally, IDAE has extended the deadline until 07/07/2024 in its resolution of October 20th, 2023. Also, various inquiries related to the grant have been addressed.
- Analysis and study of the feasibility to declare the biopolygon as a "Strategic Project", according to the criteria established in f the Agreement GOV/177/2022, of September 6th, 2022.
- Follow up throughout the entire process to obtain approval of the Special Urban Development Plan submitted by Alcarràs Bioproductors. On September 29th, 2023, the Special Urban Development Plan was approved definitively by Territorial Commission of Catalonia.
- Following up the administrative procedure to obtain the environmental authorization to carry out the activity. It was obtained on July 20th, 2023.
- Preliminary study on how to establish an energy community.
- In relation to the legal entity of Alcarràs Bioproductors, the Association:
    - Legal analysis of the governance framework under which the Association operates.
    - Legal analysis of the legal framework under which the members of the Association participate in current and potential new projects.

- Legal advice in the identification of a more simplified governance and legal framework to operate.

Outcomes & results

At the end of the service process, the Accelerator prepared a **final report**, summarising all phases of the project: the barriers identified, roadmap designed, services delivered, and the main results achieved. This report, presented in PowerPoint format, serves as a full overview of the project's progress and next steps.

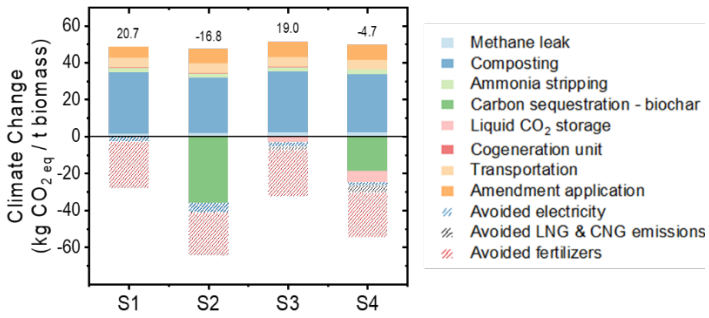
In parallel, a **satisfaction survey** was conducted with two key contacts from the project team. The results confirm a high level of satisfaction with Bioboost's support:

- Service range: both respondents confirmed that they received comprehensive services including circular economy guidance, technical assistance, legal support, and business and financing advice.
- Service quality: both participants rated the quality of the services at 5 out of 5.
- Team communication: rated 5 out of 5, highlighting excellent responsiveness and collaboration.
- Technical expertise: both respondents affirmed that the Bioboost team demonstrated the necessary knowledge and experience.
- Results achieved: one respondent rated achievement of expected outcomes at 4 out of 5, the other at 5 out of 5, showing strong alignment between the services provided and the project's needs.
- Areas for improvement: participants suggested increasing the availability of resources to support a growing number of initiatives simultaneously.

Moreover, an **environmental, economic and social impact assessment** was performed for the four scenarios shown below:

	Feedstock	Technologies included	Business models
Scenario 1	- Manure with straw - Slurry	- AD plant (1 digestor) - CHP unit - Composting plant	- Biogas for electricity - Compost, ammonium sulphate and nitrogenated water
Scenario 2	- Manure with straw - Slurry - Agricultural wood (agroforestry)	- AD plant (1 digestor) - CHP unit - Composting plant - Pyrolysis - Syngas cleaning	- Biogas for electricity - Compost, ammonium sulphate and nitrogenated water - [Pyrolysis =] biochar - [Biochar + digestate =] organic amendment
Scenario 3	- Manure with straw - Slurry - Organic waste - Sewage sludge	- AD plant (2 digestors) - CHP unit - Composting plant - Biogas upgrading - Liquefaction plant	- Biogas for electricity - [Cryogenic Distillation =] liquid biomethane (bio-LNG) and compressed biomethane (bio-CNG) - Compost, ammonium sulphate and nitrogenated water
Scenario 4	All	All	All

The environmental impact assessment showed that scenarios 2 and 4 perform best in terms of environmental impact, with a high potential of CO2 sequestration.



Impact Category	Climate Change (kg $CO_{2\text{-eq}}$/t waste)	Acidification (mol $H^{+}_{\text{-eq}}$/t waste)	Eutrophication (mol $N_{\text{-eq}}$/t waste)
Scenario 1	20.7	0.22	0.42
Scenario 2	-16.8	0.20	0.45
Scenario 3	19.0	0.22	0.41
Scenario 4	-4.7	0.22	0.42

Regarding the social impact, scenarios 2 and 4 would also create the most jobs per ton of biomass treated.

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Direct jobs created	9	15	18	24
Indirect jobs created	6	10	12	16
Induced jobs created	4	6	7	10
Total jobs created	**19**	**31**	**37**	**50**
Direct jobs /t biomass	$1.2{\cdot}10^{-4}$	$1.8{\cdot}10^{-4}$	$1.2{\cdot}10^{-4}$	$1.5{\cdot}10^{-4}$
Indirect jobs/ t biomass	$8.0{\cdot}10^{-5}$	$1.2{\cdot}10^{-4}$	$7.7{\cdot}10^{-5}$	$1.0{\cdot}10^{-4}$
Induced jobs/ t biomass	$5.3{\cdot}10^{-5}$	$7.6{\cdot}10^{-5}$	$5.0{\cdot}10^{-5}$	$6.5{\cdot}10^{-5}$
Total jobs/ t biomass	$\mathbf{2.5{\cdot}10^{-4}}$	$\mathbf{3.8{\cdot}10^{-4}}$	$\mathbf{2.5{\cdot}10^{-4}}$	$\mathbf{3.2{\cdot}10^{-4}}$

Regarding the economic impact, scenarios 3 and 4 show the largest revenues and margins, and scenario 4 shows the best return of investment (ROI) and net present value.

Parameter	Scenario 1	Scenario 2	Scenario 3	Scenario 4
CAPEX (€)	4,363,722 €	6,829,976 €	8,572,299 €	11,992,625 €
OPEX (€/y)	806,772 €	1,310,973 €	1,609,802 €	2,129,392 €
Revenue (€/y)	729,812 €	1,516,713 €	1,850,858 €	2,968,756 €
Profit margin (€/y)	-76,961 €	205,740 €	241,056 €	839,365 €
NPV (€)	-5,941,031 €	-2,857,332 €	-3,917,723 €	4,036,767 €
IRR (%)	-	1.0	0.3	11.0
ROI (%)	-3.5	5.6	5.2	12.8
POT (years)	-	17.9	19.2	7.8

Funded by the European Union

Biobooster 3: Casa Ametller

Description

Project description

Ametller Origen is a company founded in 2001 specialized in the production and distribution of food products. The company owns and operates about 200 stores in Catalonia, where it distributes agricultural products and processed food, some of them cultivated and manufactured by themselves.

Following their objective to contribute to the improvement of food and people's health, in the last years, they have initiated the Agroparc Penedès (Gelida, Barcelona, Spain). A space that integrates agriculture, livestock, agro-industry (including alternative protein production) and renewable energy generation. The Agroparc Penedès will be the first circular agro-industrial district with positive energy and negative CO_2.

In addition, they are planning to install the Agroparc Mont-Roig (Mont-Roig del Camp, Tarragona, Spain). The initial project will count with more than 45ha of technical greenhouses to produce organic horticulture products and host R&D initiatives. The project will also count with renewable energy production.

Needs and barriers identified

Being the first circular agro-industrial district, the project counts with several barriers for its implementation. Here are the main ones identified:

- The project dimension requires innovative public-private funding formulas to build the 2 Agroparcs.
- The project faces the opposition from local citizens and requires public opinion acceptance.
- Limited vision of other companies or industries resources surplus/needs that could be integrated in the Agroparc model (industrial symbiosis).
- Lack of technical knowledge to identify the most appropriate technologies to optimize resources and subproducts valorization and limit CO2 emission.

Potential services to offer – roadmap

Based on the above needs and barriers. Bioboost propose a set of services tailored to the specific needs of the Agroparc Mont-Roig, which has the most potential to receive Bioboost's services. Agroparc Penedès is in later stages of development, and the project is already defined and does not find so many barriers.

Agroparc Mont-Roig

1. Proposal to expand the business model to optimize biowaste valorisation
    1. Mapping of local resources that are currently not valorised
    2. Confirm the feasibility of producing energy from biowaste (biogas and pyrolysis)
    3. Valorisation routes of the products obtained (biogas and by-products)
    4. Mapping of potential regional actors interested in the project
2. Business model evaluation considering (1)
3. Search for co-financing strategies
4. Evaluation of the use of regenerated water
5. Analysis of the regulatory barriers encountered in order to create a list of recommendations

PDA services and outcomes

Offered services

Facilitation:

- Assessment of systemic impact potential from available resources, includes evaluating surplus resources and detecting opportunities beyond the core project. The focus is on identifying synergies within the existing metabolism to maximize impact.

- Mapping of local fermentable and non-fermentable biomass resources that could be valorised in the future anaerobic digestion and pyrolysis plants, and identification of potential stakeholders interested.
- Proposal connections with other projects in the area, fostering a collaborative ecosystem.
- Opportunity detection mapping
- Monitoring indicator evaluation and prioritization system

Technical:

Proposal of technical solution to valorise agri-waste from Ametller Origen production site and other local agriculture sites and forest through anaerobic digestion and pyrolysis.

- Evaluation of the types of biomass (feedstock): fermentable and non-fermentable
- Evaluation of the substrate quantity, quality and energy production
- Determination of the biogas parameters using the different feedstocks available
- Determination dimension of the anaerobic digestion and pyrolysis plant
- 4 scenarios assessed considering different types of feedstocks and calculation of dimension needed for the plant in each scenario.
- Energy balance: Through this analysis it is possible to estimate the energy produced and the one consumed in the plant, obtaining the net energy produced to be used as a resource.
- Economic proposal: An estimated CAPEX for the prosed biogas and pyrolysis pilot plant has been calculated for each scenario.

Business and Financing:

Proposal to expand the business model to optimize biowaste valorisation:

- Viability of biogas production integration (biogas and pyrolysis)
- Assessment of all end-products from the process and their market potential and potential off-takers.
- Mapping regional stakeholders interested into the project
- Developing circular business models tailored to the new value stream created.
- Search for innovative funding scheme
- Assessment of investment needed, potential investment structure, and preliminary financial KPIs (revenues, costs, EBITDA, IRR, etc).

Legal and Administrative:

In order to analyse the urban barriers encountered by the Casa Ametller Project in Mont-roig del Camp and to obtain a series of *lessons learnt* that can serve as recommendations for other projects of similar characteristics, we would need to access, as far as possible, the following information and/or documentation:

- Project Location
- Technical project or project description
- Documentation on the administrative processing of the project (certificate of urban compatibility, licences, report from the territorial urban planning commission, etc.)
- Description of the urban planning problem

Outcomes & results

The Biobooster is still ongoing, however, so far the consortium has achieved the following results:

- Gathered success cases of implemented biogas and pyrolysis plants, compiling information about the investment mobilised, type of investment, capacities, governance model, business model, financing model.
- Analysed specific regulatory barriers.

- Mapping of available biomass resources nearby (own resources, other fermentable and non-fermentable biomass resources). Fermentable resources mapped (215k t biomass in "Baix Camp" region, 32k t of biomass in "Mont-Roig, Cambrils i Vandellós-l'Hospitalet" regions. Non-fermentable biomass resources mapped (50k t in "Baix Camp" region from prunnings and forest, 7k in "Mont-Roig, Cambrils i Vandellós-l'Hospitalet" regions, 6k from garden waste in 5 other municipalities.
- Technical feasibility study of production of energy through anaerobic digestion and pyrolysis and estimation of investment needed. Three scenarios with different capacities have been proposed.
- Financial feasibility, preliminary financial projections.

Next steps include assessment of the proposed project by Ametller Origen and if they want to move forward, provide a more detailed plan, contact identified stakeholders, structure investment, preparation of materials.

Biobooster 4: Wool processing plant in Tagamanent

Description

Project description

One of the main problems of farmers on small family farms is the difficulty of valuing the resource of sheep wool obtained after shearing, they do not obtain profit due to the difficulties they have to collect it in a remunerated way it is considered a waste. The wool washing is regulated by European regulations due to its water's consumption and effluents it requires. The wool processing industry does not accept small batches as in these cases, although feasible on a small scale, the maintenance and operation of the machinery and the problems of water and energy continue to make the alternative unviable to be abandoned. Thus, making the farmer choose to dispose of the product as waste without recovering it, with the corresponding management and treatment costs. One of the main problems of farmers of small family farms is the difficulty of valuing the resources of sheep wool obtained after shearing, they do not obtain profit and due to the difficulties, they must collect it in a remunerated way it is considered a waste. The wool washing process is regulated by European regulations due to its consumption of water and effluents it requires. The wool processing industry does not accept small batches as in these cases, although feasible on a small scale. the maintenance and operation of the machinery and the problems of water and energy continue to make the alternative unviable both economically and in terms of sustainability. This difficulty causes the practice of washing to be abandoned. Thus, making the farmer choose to dispose of the product as waste without recovering it, with the corresponding management and treatment costs. The purpose of this project is the definition of a wool treatment system in small quantities, modular, portable and replicable in other parts of the territory, which allows its implementation in areas close to livestock farms, and that allows them to value their wool from sorting and washing to carding and spinning, achieving a local production chain and recovering what is currently a waste.

Needs and barriers identified

- Current state of the market for wool-based products: (textile, bioconstruction, home products, production of chemicals such as lanoline o queratine, etc.)
- Business model for the potential market products
- Co-financing for the project implementations
- Humans' resources for the project's implementation
- Search of stakeholders for increasing the systemic impact

Potential services to offer – roadmap

Based on the needs and the barriers identified to the date are:

- Organization of a Catalan hub with relevant stakeholders of the wool to increase the systemic impact, including the whole wool value chain: wool producers (farms), washing machines companies, companies for wool transformation, research centres devoted to R&D activities and final users
- Development of the bases for the business model
- Evaluation of the market products based on wool: yarn for textile, building insulation, fertilizers, carpets and mattress, chemical products.

PDA services and outcomes

Offered services

Facilitation:

- Analysis of potential systemic impacts.
- Support in story-telling building to motivate the stakeholder's members to implement the project.
- Search and contact potential stakeholders for the creation of a Catalan Hub for the wool.
- Support in the evaluation of the project from the technical point of view to evaluate the resource needed in terms of water and energy consumption.

- Preliminary exploration of market opportunities and value chains for wool-derived products such as yarn, insulation, and natural fertilisers.

Technical:

Aeris is the project manager of the Biobooster. To the date, no technical services has been offered due to the current state of the project. However, Aeris has offered:

- Evaluation of the project from the technical point of view to evaluate the resource needed in terms of water and energy consumption.
- Search and contact potential stakeholders for the creation of a Catalan Hub for the wool.
- Support in story-telling building to motivate the stakeholder's members to implement the project.
- Support in analysis of potential systemic impacts.

Business and Financing:

- Analysis of types of wool and the different markets for the clean wool (colorants for textiles, agriculture, bioconstruction, yarn production, mattress or pillows filling, upholstery, decoration).
- Analysis of business model: CAPEX, OPEX, potential revenues, profit margin, etc.
- Contact and interview with potential wool end-users, validation of their willingness to pay.
- Financing options analysis (private and public).
- Investment structuring.
- Support in story-telling building to motivate the stakeholder's members to implement the project.
- Support in analysis of potential systemic impacts: economic, social, and environmental impact. Ongoing Life Cycle Assessment, process design, impact of each of the end applications for the wool versus current scenario.
- Study of how to include economic profit from ecosystem services in the business model: benchmark other projects doing similar things, add economic profitability for shepherd in return of the forest management task that they do with the sheep (wildfire control, etc).

Legal and Administrative:

- Preliminary study on the legal requirements to use the wool in different applications (textile, construction, agriculture).
- Identification of the requirements to become a member of the International Wool Textile Organisation.
- Preliminary analysis of the most suitable legal structure to establish a group of different actors from the Catalan wool sector.

Outcomes & results

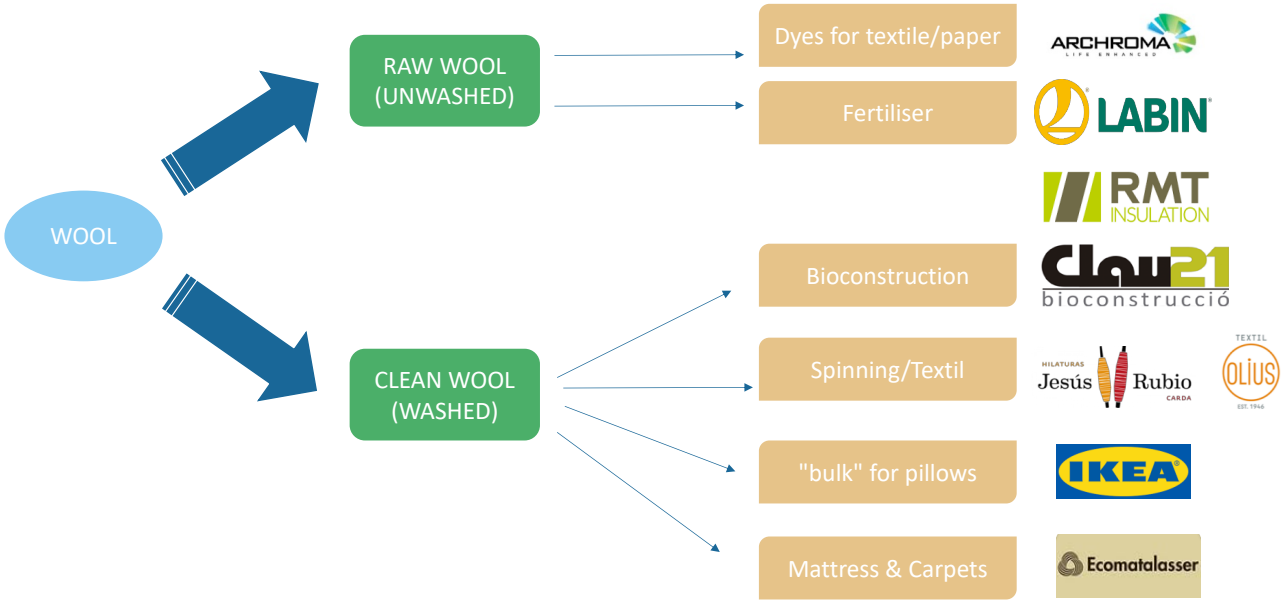
To the date, we have created a group with different actors related to the wool sector such as Public Administration, Research centres and private sector (companies) interested in the project. A first on-line meeting had been carried out to put in common the needs and the barriers to solve related to the valorisation of sheep wool. After this first meeting, it became clear that to overcome the sector's fragmentation, it was necessary to promote the creation of a working group that would bring together all the actors in the wool valorisation value chain. This collaboration space, which was initiated with the first Wool Hub event last October 2024, has facilitated the sharing of needs, resources, and strategies to structure a viable model for wool valorization. Currently, the Hub has over 50 contacts from various fields, including wool producers, artisans, research and innovation, machinery companies, public administration, and end users from different sectors (bioconstruction, textiles, fertilizers, etc.).

The complexity of the project from a technical perspective, in terms of finding commercial machinery capable of processing smaller quantities of wool, has been a challenge.

On the other hand, to ensure the economic viability of the project, BIOBOOST has conducted a detailed analysis of potential markets, considering the quality of the wool and the requirements of different sectors. The main challenge is to find a market where both clean and raw wool have value and can be a resource for creating high value-added products.

There is an ongoing economic, social, and environmental impact assessment to quantify the impact of each of the end applications for the wool versus current scenario, as well as the ecosystemic impact that the sheep have for forest management and wildfire prevention.

Market opportunities for the wool have been identified, which can be dived in two main groups: applications for raw wool (unwashed) and applications for clean wood (washed).



The Tagamanent wool processing plant project constitutes a pioneering model for wool valorization in Catalonia. Thanks to the support of BIOBOOST, significant advances have been achieved in establishing a network of stakeholders, defining a viable business model, and exploring strategic markets.

This project lays the technical, economic, and legal foundations for the implementation of future wool valorization plants in other regions, thereby promoting the circular bioeconomy and revaluing a resource that is often underutilized.

Funded by the European Union

Biobooster 5: Open access plant for the industrial pre-scaling of alternative protein

Description

Project description

The Project involves the implementation and acceleration of an open access plant for the industrial pre-scaling of alternative protein extraction, production and transformation processes and it is promoted by the Area of Economic Strategy, in the Secretariat of Economic Affairs and European Funds of the Generalitat de Catalunya (Public Administration).

Currently, the alternative protein market is dominated by soy or yellow pea protein (plant-based producers), however, many companies are experimenting and looking for alternatives to these products. Therefore, this industrial pre-scaling plant aims to provide an innovative solution to this identified need in the agri-food sector of Catalonia and create a space that facilitates the development of industrial investments in the bioeconomy.

It is foreseen that during the first 5 years; the Project will be financed by Public Administration (49%) and private sector financing (51%).

Needs and barriers identified

- Regulation of the public-private relations of the plant
- Intellectual and Industrial Property issues
- Searching of private investors
- Development of evaluation criteria for the selection of participate in the plant.

Potential services to offer – roadmap

Based on the needs and the barriers identified to the date the following potential services have been identified:

- Public-Private Business Model Evaluation.
- Governance Model: analysis of legal frameworks regulating public-private relations.
- Search for co-financing: private investors
- Intellectual and Industrial Property Law services.
- Development of evaluation criteria for selection to participate in the project.

In this sense, in this initial stage of the project, we aim to propose innovative and systemic solutions to regulate the public-private relations aspects of the different actors involved in the Project and create a preliminary business model to accelerate and facilitate the implementation of the Plant.

PDA services and outcomes

Offered services

Facilitation:

- Explore the possibility of linking the project with the Alcarràs Biopark, to assess whether it could be integrated into an existing bioeconomy infrastructure. This option was ultimately ruled out due to project-specific constraints.

Technical:

No technical services are required at this current stage.

Business and Financing:

Support on building the most suitable business model and exploitation strategy for the industrial pre-scaling plant. To provide this support, the following aspects will be considered:

- Value proposition
- Market segmentation
- Process optimization
- Risk evaluation and mitigation.
- Relationship with potential customer and appropriate communication channels
- Key activities and resources
- Strategic partners
- Requires Investment and operational costs (CAPEX & OPEX)
- Financing options (Public and private)
- Investment structure

Legal and Administrative:

- Governance Model:
    - Analysis and identification of the optimal legal framework to regulate the public-private legal relations of the Plant for the industrial pre-scaling of alternative protein extraction.
    - Defining how to implement the selected governance model.

- Intellectual and Industrial Property Law services:
    - Support in creating a Non-Disclosure Agreement (NDA) model to sign with companies willing to use the Plant (service provider company and potential clients of the Plant).
    - Provide guidelines for establishing an Intellectual and Industrial Property protocol for the Plant.

Outcomes & results

Given the ongoing nature of the project, concrete outcomes and results are yet to be achieved.

In mid-2024, the Biobooster decided to reevaluate and redesign certain aspects of the Project to ensure the sustainability of the Plant, taking into account costs and the initial focus of the business plan. In this context, the Project is considering the implementation of a more versatile plant that provides service to sectors other than the food industry.

At this time, the Biobooster is **paused**.

Biobooster 6: Plana de Vic Cooperative

Description

Project description

Plana de Vic Cooperative (CPV) was founded in 1966 by farmers from Osona with the goal of adding value to the local farmers. The biogas plant project arises from CPV's desire to offer its member farmers a solution to improve and reduce the costs associated with managing livestock waste, especially manure. CPV has begun working with Technological Centre Beta to promote this project, and together they decide that it is necessary to involve a third partner from the energy and engineering sector with the capacity for investment, technical knowledge to operate the plant, and expertise in the biogas market. Genia Bioenergia is chosen.

The volume and material to be processed have been defined, and an initial size of the plant has been planned considering the actual production of the CPV. They are currently focused on finding a suitable location, which has proven to be quite challenging. At present, they have three possible sites.

Needs and barriers identified

- Site – location of the plant: this is the aspect that has been the most challenging for them, and they have been working on it for a long time. Finding a location that complies with current regulations (distance between farms and the Anaerobic digestion) is difficult, especially since there are not many available sites in the area. They are currently considering three possible options.
- Social rejection: related to the location, there is a negative perspective from the local community regarding the acceptance of the site.
- Technical - economic aspects: proposals for valorizing digestates (solid fraction) as an alternative to composting, and for the liquid fraction of the Anaerobic Digestion (possible uses). Also, proposals to minimize odours and the potential visual/social impact.
- Legal: managing administrative procedures makes the process slow and complicates progress in the project.

Potential services to offer – roadmap

PDA services and outcomes

Offered services

Facilitation:

- Mapping of potential input suppliers for the biogas plant, to identify nearby farms or waste producers that could contribute to feedstock availability.
- Support in identifying and exploring potential end-users for digestate-based products.

Technical:

Analysis of the technical proposal for the biogas plant for the valorisation of the dejections.

- Evaluation of alternative scenarios to increase the biogas production: CPV biogas will be feed with the current rent production (tons/year) of dejections (slurry and manure). However, they are considered to use SANDACH as an additional feedstock. An evaluation of other 2 possible alternative scenarios for maximising the biogas production has been performed.
    - Scenario 1: Slurry and manure.
    - Scenario 2: Slurry, manure and SANDACH.
- Consider other valorisation technologies for the liquid effluent such as nitrification and denitrification.
- Consider other valorisation application for the solid effluent such as fertilizers or applications (solar/hybrid drying).
- Strategies to reduce the social impact of the plant: minimizing and/or eliminating odours, truck movement, etc.

Business and Financing:

No business and financing services are required at this current stage.

Legal and Administrative:

- Resolution of legal inquiries and interpretation of applicable legislation. Among others:
  - Legal advice regarding the required distance between a biogas plant processing SANDACH (Animal By-Products Not Intended for Human Consumption) of categories 2 and 3, and a livestock farm.
- Providing updates and insights to clients regarding regulations pertinent to their interest. Specifically, about the recent approval of Agreement GOV/39/2025, dated February 11, which sets forth the criteria for designating a business project as strategic in the realm of biogas production through anaerobic digestion of livestock manure and organic waste in Catalonia.

Outcomes & results

- Evaluation of the 2 scenarios and dimension proposal of the anaerobic digestion plant
- Technical alternatives for the valorisation of the solid fraction (digestate): solar dryer, hybrid dryer or pyrolysis.
- Technical alternatives for the valorisation of the liquid fraction: nitrification/denitrification, production of fertilisers, etc.
- Technical proposals for the design of the plant to minimise the odour emissions
- Material balance: estimation of inputs/outputs for the proposed plant
- Economic proposal: An estimated CAPEX for the prosed biogas pilot plant
- Resolution of legal inquiries and interpretation of applicable legislation

Biobooster 7: Compost Segrià

Description

Project description

Waste recovery through composting for companies in the agri-food industry, for urban waste management entities and for farmers/ranchers. Their main objective is to manage and recover waste in order to transform it into an organic fertilizer of the highest quality. Process different types of non-hazardous organic and biodegradable materials from the agri-food, urban, industrial, agricultural and livestock industries.

Needs and barriers identified

- Lack of investment
- Enhance systemic impact

Potential services to offer – roadmap

The project was well defined, stakeholders were identified, they had a basic engineering study, feedstock identified and quantified.

Bioboost's support could consist of materials preparation (e.g. preliminary business plan and financial plan), investment structuring, searching for investment, impact assessment.

PDA services and outcomes

Offered services

No services were offered.

Outcomes & results

Accepted with support from the EAC. However, the project is currently suspended following a strategic decision by the promoter and their investors to implement the project without Bioboost's support.

Biobooster 8: Insectius

Description

Project description

Insectius is a startup dedicated to optimizing insect farming through advanced technologies and a circular production model with a positive environmental impact. The company offers modular and biotechnological farms for breeding the Black Soldier Fly, optimized through a technological platform that provides real-time data on their performance. It operates under a B2B business model, with its main clients being companies within the food industry seeking alternative protein sources. This solution is profitable and efficient for the agricultural and livestock sectors, promising a reduction in unvalued organic waste (which will serve as feed for the larvae) and the production of alternative protein for the manufacture of feed for production animals such as poultry, pigs, or fish farms (insect meal or dehydrated larvae) or organic fertilizer for the soil. The implementation of these portable farms aims to contribute to reducing the environmental footprint and promoting a circular economy model.

Needs and barriers identified

As an innovative project, several legal barriers to its implementation have been identified during this initial stage:

- Regulatory Framework of the activity

Potential services to offer – roadmap

- Identification and interpretation of the applicable regulatory framework for the feeding of BSF larvae.
- Feasibility of business expansion through a modular farm franchise model.
- Restrictions on the labelling and marketing of organic fertilizer and insect meal.
- Restrictions on the legally valid designation of organic fertilizer.
- Assessment of the possibility of obtaining an alternative certification to enhance the marketing of insect meal and organic fertilizer.

PDA services and outcomes

Offered services

Facilitation:

No facilitation services are required at this current stage.

Technical:

No technical services are required at this current stage.

Business and Financing:

No business and financial services are required at the current stage.

Legal and Administrative:

At this stage, we are currently doing an initial and preliminary study of the following issues:

- Identification and interpretation of the applicable regulatory framework for the feeding of BSF larvae.
- Restrictions on the labelling and marketing of organic fertilizer and insect meal.
- Restrictions on the legally valid designation of organic fertilizer.

Outcomes & results

- Preliminary legal study covering the regulatory framework for BSF larvae feeding protocols and the restrictions on the labelling and marketing of organic fertilizer and insect meal products.
- Preliminary conversations with investors to join the current private fundraising.

Biobooster 9: Labin Products

Description

Project description

Labin is a Catalan company specialised in the development and distribution of fertilisers and bio-based agricultural products. The company is currently developing a new line of bioactive peptides derived from animal-based hydrolysates, to be used as bioestimulants in agriculture. These peptides activate plant physiological responses that improve nutrient uptake, stress resistance, and overall productivity. The innovation lies in their use of animal by-products (SANDACH categories 2 and 3), through enzymatic hydrolysis and microbial fermentation, to produce high-value bioproducts aligned with regenerative agriculture and circular economy principles. A pilot plant is being finalised with a processing capacity of 1,000 tonnes/year of inputs, aiming to produce around 300 tonnes/year of peptide-based outputs. If successful, Labin plans to scale to an industrial plant with a capacity of 10,000 tonnes/year.

Needs and barriers identified

- Regulatory complexity, particularly around the use of animal by-products under the SANDACH regulation (EC 1069/2009), requiring clarification on permitted uses and risk categories.
- Input supply risks, depending on the availability and classification of raw materials from the tanning and agri-food sectors.
- Product characterisation and market positioning for a new category of bioestimulants with complex biochemical properties.
- Process scalability, including energy efficiency, material handling, and odour control.
- Access to funding, especially for infrastructure expansion and industrial validation phases.

Potential services to offer – roadmap

- Mapping of potential alternative protein sources in the local territory, including the agri-food and pet food industries.
- Strategic support to explore new business opportunities with by-products (e.g., lipid applications).
- Support in regulatory adaptation.
- Identification of potential collaborators in R&D or the circular bioeconomy ecosystem.

PDA services and outcomes

Offered services

Facilitation:

- Supported the company in mapping alternative protein sources within the region, with a focus on agri-food and pet food industries.
- Initiated an exploratory analysis of potential supply chains for animal-based by-products, including proximity mapping, logistical feasibility, and sourcing conditions.
- Facilitated the identification of potential strategic partners for collaboration in R&D, bioeconomy innovation, and industrial symbiosis, including those involved in processing complementary biomass streams.
- Assisted in structuring the initial stakeholder network, setting the stage for future partnerships and value chain integration.

Technical:

- Evaluation of the gas emissions generated during the process to mitigate them

Business and Financing:

No business and financial services are required at the current stage.

Legal and Administrative:

No legal and administrative services are required at the current stage.

Outcomes & results

- Initial mapping completed of regional sources of animal protein by-products, including suppliers from the human food industry, and pet food industry within a 40 km radius of the Labin facility.
- Shortlist of potential collaborators identified across the circular bioeconomy value chain, including R&D centres, industrial actors with compatible by-products, and circular innovation clusters.

Biobooster 10: Ecotros

Description

Project description

Regenerative farm of 30 hectares of olive, carob and almond trees certified by CCPAE since 2015. They produce healthy products with a minimal carbon footprint. Currently they manage pruning waste by producing artisanal biochar. They want to scale up biochar production by installing a pyrolysis plant and producing high value-added biochar as bio stimulant.

The business model is identified and quantified.

Needs and barriers identified

- Identification of local stakeholders to enhance systemic impact.
- Identification of local biomass susceptible for valorisation in the area.
- Optimisation of transportation and logistics for biomass harvesting, storage and pre-treatment. Ensure efficient and cost-effective collection and transport of woody biomass by assessing technical feasibility, available machinery, and logistics costs.
- Technical feasibility study of the proposed solution.
- Urban barriers: urban planning barriers related to the permitted uses and activities on the selected land and within the municipality.
- Business model building.

Potential services to offer – roadmap

- Technical feasibility study of forest biomass harvesting process, storage, and necessary pre-treatment steps.
- Provide support in managing commitments to ensure the reliable supply and logistics of biomass, with a specific focus on woody biomass.
    - Identification and coordination of available machinery for the collection and processing of woody biomass.
    - A technology mapping exercise to identify existing solutions for biomass shredding and logistics.
    - Collection and provision of updated information on the market prices of shredding services and related logistics.
    - Assistance to stakeholders in planning and optimizing the biomass supply chain from forest to processing site.
- Stakeholder engagement: enhanced contribution of the forest-based sector, public administration for forest management, forest owners and managers adopting sustainable forest management practices and novel technologies to better valorise unused and underutilised biomass.
- Development of new value chains, innovative business models and technologies resulting in novel bio-based chemicals, compounds, materials, and products from unused and/or underutilised forest biomass.
- Business model building with different scenarios including sensitivity analysis of the cost of biomass harvesting, pre-treatment, transportation, and check the economic feasibility of the solution and if there is potential for economic sustainability of the plant.
- Business model monetizing the ecosystemic impact of forest biomass harvesting by local stakeholders with incentives, ensuring additional incomes for forest owners and managers.
- Analysis of CAPEX and OPEX.
- Ensure biomass supply agreements.
- Investment structure analysis.
- Review with public administration EU carbon farming certification methodologies for the unused and underutilised forest biomass in long-lasting products (e.g., through forest protection, afforestation, and sustainable forest management.

PDA services and outcomes

Offered services

Facilitation:

- Mapping of local woody biomass resources within the municipality to assess potential feedstock availability and support the deployment of a small-scale pyrolysis plant.
- Initial steps in business model definition, focused on guaranteeing a stable biomass supply for the proposed plant.
- Market exploration for high-value biochar, aimed at justifying the upstream efforts in sourcing and processing forest biomass.
- Identification and engagement of key stakeholders, including local forest owners, forest managers, and public entities.
- Coordination of meetings with local councils and Ecotros to explore possibilities for public-private collaboration models in managing forest biomass and supporting the project's long-term viability.

Technical:

Technical services have not been provided yet.

Business and Financing:

Business and financing services have not been provided yet.

Legal and Administrative:

Preliminary legal analysis of the urban planning feasibility of the chosen location for the project.

Outcomes & results

- Preliminary mapping of local woody biomass resources within the municipality to assess potential feedstock availability and support the deployment of a small-scale pyrolysis plant.
- Stakeholder engagement: enhanced contribution of the forest-based sector, public administration for forest management, forest owners and managers adopting sustainable forest management practices and novel technologies to better valorise unused and underutilised biomass
- Preliminary legal assessment of the urban planning feasibility of the selected location for the project, with particular attention to the applicable municipal urban planning regulations.

Biobooster 11: Crinatur Energy

Description

Project description

The Crinatur Baronia project is a pioneering circular bioeconomy initiative promoted by the municipality of La Baronia de Rialb (La Noguera, Lleida), with involvement from the municipalities of Artesa de Segre, Oliana, Bassella, Peramola, and Banyoles. The project seeks to address multiple environmental challenges such as wildfire risk, excessive accumulation of unmanaged forest biomass, nitrate pollution of groundwater, and greenhouse gas emissions from intensive livestock farming.

The core technological solution integrates anaerobic digestion and fluidized-bed gasification to transform both livestock waste and residual forest biomass into valuable outputs: Renewable energy: biogas and syngas (further refined into syncrude); recovered water for agricultural use; usable residual heat for

industrial or greenhouse applications.The project is located on a privately owned 200 ha site, with 5 ha allocated for the plant. The Centre de la Propietat Forestal supports biomass sourcing strategy.

Needs and barriers identified

- Technological feasibility validation
- Studying other alternatives at a technological level
- Governance: what type of entity should manage the project?
- Governance: identifying actors should be involved.
- Structuring investments
- Investor search
- Supply contracts, sales contracts, supply guarantees
- Environmental, social, economic impact assessment

PDA services and outcomes

Offered services

Facilitation:

Facilitation services have not been provided yet.

Technical:

Technical services have not been provided yet.

Business and Financing:

Business and financing services have not been provided yet.

Legal and Administrative:

Preliminary legal analysis of the urban planning feasibility of the chosen location for the project.

Outcomes & results

This Biobooster has been ongoing for 3 weeks, we are still waiting for more inputs from the project promoters so that we can analyse what they have done so far and how to move forward.

The table below summarises the eleven Biobooster projects supported to date, indicating the lead partner responsible for each case and the number of PM each partner dedicated to their development during RP2.

Summary of partner effort (PM dedicated per project) during RP2

#	Name	INV	SYM	AERIS	RJ
1	Coopirenaica	0	0	0	0
2	Alcarràs Bioproductors SAT	1.8	1.4	1.0	1
3	Casa Ametller	3	2.3	3.0	0.7
4	Open access plant for the industrial pre-scaling of alternative protein	1	0.8	0	4.13
5	Wool processing plant in Tagamanent	4	5.6	6.5	2.6
6	Plana de Vic Cooperative	0	0.4	3.1	1.0
7	Compost Segrià	0.2	0.1	0.1	0.1

8	Insectius	0	0	0	1.9
9	Labin Products	0	3.2	0.1	0.1
10	Ecotros	0.2	0.6	0	0.6
11	Crinatur Energy	0.4	0.3	0.1	0.1
	Coordinating and leading the work package, deliverables D3.1 and D3.2.	0.5	7.4	0.5	0.5
	Managing potential Bioboosters that were not selected, including initial meetings	0.5	2.3	0.5	0.5
	TOTAL	11.6	24.3	14.9	13.23

The operation of the Accelerator across RP1 and RP2 has required a significant allocation of human resources to deliver Project Development Assistance (PDA) services, manage the Biobooster portfolio, and coordinate the work package. The following table provides a summary of person-months dedicated per Biobooster and activity by partner, with a breakdown of actual effort invested and estimated effort required for the final project year (RP3).

Summary of partner effort (PM dedicated per project) during since the beginning of the project

#	Name	INV	SYM	AERIS	RJ	ALL	RP3 estimation
1	Coopirenaica	4	1.1	1.21	1.5	7.81	0
2	Alcarràs Bioproductors SAT	4.8	6.5	2.15	3.65	17.1	0
3	Casa Ametller	4.5	3.1	3.1	0.8	11.5	3.5
4	Open access plant for the industrial pre-scaling of alternative protein	1.9	0.9	0	5.13	7.93	0
5	Wool processing plant in Tagamanent	4.5	6.4	7.25	2.91	21.06	0.5
6	Plana de Vic Cooperative	0	0.4	3.1	1.0	4.5	1
7	Compost Segrià	0.2	0.1	0.1	0.1	0.5	0
8	Insectius	0	0	0	1.9	1.9	13.1
9	Labin Products	0	3.2	0.1	0.1	3.4	11.6
10	Ecotros	0.2	0.6	0	0.6	1.4	13.6
11	Crinatur Energy	0.4	0.3	0.1	0.1	0.9	14.1
	Coordinating and leading the work package, deliverables D3.1, D3.2. and D3.3.	1.0	9.0	0.5	0.5	11.0	6
	Managing potential Bioboosters that were not selected, including initial meetings	1.0	3.1	0.75	0.75	5.6	0.5
	TOTAL	22.5	34.6	18.36	19.04	94.6	61.9

As of May 2025, the total number of person-months dedicated to WP3 activities amounts to 94.6 PM. This reflects the full support given to eleven selected Bioboosters as well as transversal tasks such as coordination and initial project scouting.

At partner level:

- SYM has already executed **94.6%** of its total expected WP3 effort (34.6 of 36.56 PM),
- INVENIAM has reached **83.3%** (22.5 of 27 PM),
- RJ has used **79.3%** (19.04 of 24 PM),
- AERIS has executed **74.8%** (18.36 of 24.56 PM).

While the Accelerator is advancing towards completion of its portfolio, the experience gained during the first two reporting periods indicates that more time will be needed than initially planned to bring all Bioboosters to full investment readiness. This is due to several interrelated factors:

- **Bioeconomy projects are long-term by nature.** Their impact typically unfolds over time and often involves systemic environmental, territorial and social dimensions. As a result, the outcomes of PDA services—especially in early phases—cannot be accelerated without compromising quality or alignment with local realities.
- **Most Bioboosters required extensive facilitation and mapping.** These services are crucial for defining project scope, identifying key actors and designing viable strategies. However, they are also time-consuming, often involving multiple iterations and engagement across different sectors. In comparison, technological services were less frequently needed and were usually introduced only after strategic clarity was achieved.
- **Early Bioboosters served to build and refine the methodology.** Projects like Coopirenaica and Alcarràs were essential to test tools, align working processes among partners, and set up the internal mechanics of the Accelerator. These efforts were necessary to establish a solid support model but naturally slowed initial progress.
- **Some projects are highly complex.** Initiatives such as the wool valorisation Biobooster demanded considerably more time and effort due to their innovative nature and lack of comparable reference cases.

These elements together explain the slower-than-anticipated pace and justify the need for a longer timeline, without implying inefficiency or mismanagement.

Based on the current status of each Biobooster, we estimate an additional 64 PM will be required in RP3 to complete the ongoing work. This includes support to projects that joined the Accelerator at a more advanced stage of the project, such as Insectius, Labin Products, Ecotros, and Crinatur Energy. These four projects alone are expected to require around 43 PM in total , with an average of approximately 15 PM per project, reflecting the intensive support needed to bring them to investment readiness within the final year.

Conversely, no additional resources are expected for Bioboosters already completed, in final stages, or suspended, such as Coopirenaica, Alcarràs Bioproductors SAT, the wool processing plant, and the Open Access Plant. Likewise, coordination needs are reduced in RP3, with only one deliverable (D3.3) due. The pipeline of unselected projects is closed, and follow-up effort is minimal.

In total, when adding the effort already invested (94.6 PM) to the estimated work in RP3 (63.9 PM), the full execution of WP3 is expected to reach approximately **158.5 PM**. This significantly exceeds the original

forecast of 112.12 PM, reflecting the real complexity, diversity, and support intensity required by the Biobooster projects.

4. Main Barriers and Lessons Learnt

Throughout the second year of the Accelerator, we have observed recurring patterns across territories, technologies and stakeholders. These patterns reveal the systemic challenges that must be addressed to scale bioeconomy projects effectively, while also highlighting the transformative value these initiatives can unlock when the right conditions are in place.

4.1. Barriers encoutered

The implementation of circular bioeconomy projects through the Accelerator has highlighted a consistent set of challenges that go beyond individual project constraints. These barriers are systemic, often interlinked, and require cross-sectoral responses. Based on our experience during the second year, we group them into five broad categories:

1. Regulatory and administrative constraints

Circular bioeconomy projects often operate in a legal and institutional environment that is not adapted to their innovative nature. Many of the concepts these projects rely on—such as decentralised valorisation, nutrient recovery, or ecosystem service payments—fall outside existing regulations, especially in urban planning, land use, and waste management.

In practice, this results in:

- Slow and fragmented permitting processes, often involving multiple administrations with little coordination.
- Ambiguity in legal interpretation, which adds uncertainty for investors and project promoters.
- Lack of dedicated regulatory advisors who can help interpret and navigate regulatory requirements, especially at local or regional level.

The absence of a "systemic vision" across public policies limits the ability to scale these projects. Even though the technology may be ready, the institutional context remains a bottleneck.

2. Investment and financial gaps

Securing investment remains one of the biggest hurdles. Despite targeted communication and personalised outreach to potential funders, investor engagement has been limited. This is due to several overlapping reasons:

- High perceived risk and long payback times, particularly for low-TRL innovations or multi-actor business models.
- Minimum investment thresholds often above what most Bioboosters can absorb (€0.5-1M), making small-scale or pilot-stage projects unattractive.
- Preference for familiar sectors (e.g., bioenergy) rather than innovative models involving materials reuse, ecological regeneration, or complex value chains.

- **Mismatch between financial metrics and project outcomes**: systemic benefits like ecosystem services, soil regeneration, or territorial resilience are difficult to translate into conventional quantitative KPIs.

Moreover, even when public funding is available, application procedures tend to be complex, with long timelines and narrow eligibility. Many early-stage projects fall into the "valley of death"-too advanced for basic grants, but too immature for investors.

3. Structural and operational barriers

Beyond funding, bioeconomy projects face important structural barriers related to how projects are initiated, coordinated, and managed:

- **Limited capacity for facilitation and stakeholder mapping**, which delays the identification of synergies and alignment of interests.
- **Insufficient technical support to deploy tools** like SYNER that can visualise resource flows and symbiosis opportunities.
- **Governance complexity**: projects involving multiple stakeholders are often seen as difficult to coordinate, slowing down decision-making and diluting accountability.

In rural or semi-rural contexts, these challenges are amplified by poor logistics and infrastructure. Without central coordination or shared facilities, biomass collection, transport, and processing become costly and inefficient. This makes decentralised valorisation economically unviable unless new models of shared infrastructure and cooperative logistics are developed.

4. Barriers related to the primary sector

The participation of farmers, foresters, and cooperatives is essential for the circular bioeconomy—but this actor group also presents unique challenges:

- **Low awareness and technical knowledge** about circular practices and valorisation opportunities.
- **Limited access to training, extension services, or innovation support**, particularly in regions where agricultural models are still conventional.
- **Scepticism toward change**, often rooted in previous negative experiences or the complexity of emerging technologies.

Crucially, **many producers are reluctant to depend on large-scale investors**. They associate external capital with a loss of control over land use, project direction, or long-term governance. This creates tension between the desire to innovate and the need to maintain autonomy. As a result, many actors prefer gradual, self-financed improvements—even if they delay systemic change.

5. Communication and technological misalignment

Finally, there is a critical gap in communication between innovators and investors. Many circular projects are:

- **Unable to articulate their value in terms that appeal to funders**, particularly when the benefits are non-financial or systemic.

- **Emerging from academia or early-stage incubators**, where communication is more technical than strategic.

In parallel, many of the available technologies are poorly suited to the realities of the territories:

- **Designed for industrial scale**, and therefore difficult to adapt to small, diverse biomass sources.
- **Low in flexibility and too capital-intensive** for fragmented or seasonal use.
- **Not yet market-ready (low TRL)**, which reinforces investor hesitation and slows adoption.

This creates a paradox: promising technologies exist, but they are inaccessible, unaffordable, or unfit for real-world conditions. The need for adaptable, modular, and cost-effective solutions is urgent—along with support structures that can guide them toward market readiness.

4.2. Added value generated by Bioboosters

Despite the barriers identified, the **Bioboosters have demonstrated that circular bioeconomy projects can unlock significant value for territories**—particularly in rural and semi-rural regions where economic diversification, resource efficiency, and social cohesion are urgent priorities. The impact observed across the supported Bioboosters goes beyond technological innovation; it spans environmental, economic, social, and governance dimensions. Below are the main areas of added value documented during Year 2:

1. Demonstration of circular bioeconomy viability

The Bioboosters have successfully illustrated that circular models based on biomass valorisation are technically feasible and contextually relevant. In territories where such approaches were previously untested, the **projects have acted as proof of concept—showing that it is possible to transform residual or underused biomass into high-value products or services.** This visibility has helped reduce scepticism among local stakeholders and created a foundation for broader public acceptance and political support.

2. Economic diversification and rural resilience

By introducing new business models based on bio-based products, decentralised energy, or agri-industrial synergies, the **Bioboosters have opened up alternative revenue streams for the primary sector**. This reduces dependency on volatile commodity markets and enhances the economic resilience of farming and forestry communities. Several initiatives have explored ways to valorise side streams that were previously considered waste—such as prunings, processing residues, wool, or manure—turning them into inputs for new value chains or local supply loops.

3. Local infrastructure and energy autonomy

Where biomass is used for local energy generation, **projects have contributed to territorial energy autonomy and supported the business case for decentralised infrastructure**. This also aligns with climate goals and offers cost savings for municipalities and local industries. In parallel, discussions initiated

through the Accelerator have stimulated interest in developing shared infrastructure (e.g., collection hubs, processing centres), which could unlock economies of scale in the medium term.

4. Social inclusion and community engagement

Some projects have integrated vulnerable groups into their activities—through training, employment, or co-creation workshops. While this is not yet systematic, it highlights the **potential of circular bioeconomy projects to deliver social benefits** beyond their core environmental goals. There is a clear opportunity to formalise this aspect by incorporating social impact into project KPIs and value propositions, and by designing inclusive governance models from the outset.

5. Strengthening of local governance and collaboration

The **Bioboost support services have helped to initiate or reinforce collaborative dynamics between local actors**—including municipalities, SMEs, cooperatives, and researchers. This has been particularly valuable in regions where innovation ecosystems are still emerging. Through facilitation, mapping, and dialogue, several territories have started building multi-actor platforms capable of coordinating long-term transitions.

6. Knowledge sharing and replication potential

The tools used during the Bioboost project—such as SYNER—have proven useful in mapping flows, identifying synergies, and informing strategic decisions. These tools, along with the experiences documented in each Biobooster, are now forming a transferable knowledge base. Their application in new territories shows promise, particularly if combined with adequate facilitation support and adapted to local specificities. This enables **more effective replication and adaptation in diverse territorial contexts**. To reinforce this replicability, Simbiosy is currently **codifying the lessons learned from Bioboost and integrating them into the SYNER platform.** The aim is to make the tool more effective in guiding similar projects across different European regions, helping other territories replicate successful approaches.

4.3. Lessons Learnt

The second year of the Bioboost Accelerator has shown that **circular bioeconomy projects require more than good ideas or innovative technologies. Their success depends on how well we manage regulations, funding, communication, and collaboration between different actors**. Based on our experience, we summarise below the key lessons that can guide future actions and help improve the effectiveness of these projects.

1. Facilitation and stakeholder involvement must start early

Projects that began by identifying local actors, resources, and potential synergies had better results. This early work helped create trust, avoid duplicated efforts, and bring people together around shared goals. However, this kind of coordination is often under-funded or not prioritised.

> Lesson#1: It is essential to dedicate time and resources to mapping and facilitation from the very beginning of the project.

2. Investors need clearer information and more developed projects

We made efforts to contact investors through personalised communication, as suggested in the first-year report. However, the response has been limited. Investors often found the business models too early-stage, with unclear returns or unfamiliar risk profiles. They prefer larger, well-known investments like biogas plants, and tend to avoid small-scale, innovative, or cooperative-led projects. Many also expect minimum investments of €0.5–1 million, which is more than most Bioboosters can currently offer.

> Lesson#2: We need to improve how we present the value of these projects, develop more advanced business models, and find ways to reduce the perceived risk for investors.

3. Public-Private collaboration has potential, but it's not easy

Working together with both public and private actors could help bring in funding and expertise. However, this kind of collaboration is not always easy. There are often differences in priorities, ways of working, and expectations—especially when private investors want control that local actors are not willing to give up.

> Lesson#3: Public-private partnerships can be useful, but they must be carefully designed so that all parties feel secure and that local interests are protected.

4. Most obstacles are structural, not technological

In most Bioboosters, the main barriers were not related to the technologies themselves, but to the wider conditions needed to make these projects viable. Many teams struggled with regulations that are either outdated or not adapted to circular bioeconomy models, leading to legal uncertainty and delays. In parallel, access to funding was limited—not because of a lack of available finance, but because few funding instruments are designed to support projects that involve multiple actors, sectors, and impacts.

Coordination between stakeholders was another major challenge. Governance structures at the local or regional level are often weak or fragmented, making it difficult to manage collaboration across institutions, sectors and interest groups. In some cases, progress slowed down significantly because actors had different expectations, spoke different technical languages, or did not share a common vision.

> Lesson#4: Creating the right environment—legal, financial, and organisational—is just as important as developing the technology. Scaling up circular bioeconomy projects depends on how well we address these structural barriers and strengthen the systems that support innovation.

5. Ecosystem Services and Carbon Credits should be recognised

Many of the projects have environmental benefits such as improving soil quality, capturing carbon, or restoring local ecosystems. However, these benefits are rarely included in the economic calculations or project evaluations.

> Lesson#5: Circular bioeconomy projects should include these types of environmental services in their value proposition, as they could attract new forms of impact-based funding.

6. Social inclusion is a strength and should be made visible

Some projects work with groups at risk of exclusion (e.g., unemployed youth, rural women, low-income workers), offering training or employment opportunities. These actions show that the bioeconomy can also support social goals. However, these impacts were not always clearly included in project plans or communication.

> Lesson#6: Social inclusion should be considered a key part of each project. It should be made more visible and included in project objectives and impact assessments. This is not only fair—it's also strategic in gaining political and community support.

These lessons reflect the ongoing learning process of the Bioboost Accelerator and will continue to evolve as more projects reach maturity. A more detailed analysis will be presented in Deliverable D5.6 – Lessons Learned and Best Practices Report, to be submitted at the end of the project. This report will summarise the overall outcomes of the Accelerator, consolidate key insights, and provide actionable recommendations for promoting investment in the circular bioeconomy and increasing systemic impact across territories.

5. Quantification of Key Performance Indicators (KPIs)

The monitoring and quantification of Key Performance Indicators (KPIs) remain essential for evaluating both the performance of the Bioboost Accelerator and the impact of the supported Biobooster projects. These indicators provide valuable information into the project's effectiveness.

As the project enters its second year of implementation, the KPI framework has proven useful not only in tracking service delivery and project progress, but also in identifying emerging challenges and investment potential. Continuous evaluation and adaptation of monitoring tools will be key to ensuring that the Accelerator delivers high-impact support and contributes meaningfully to the development of a strong circular bioeconomy ecosystem in Catalonia.

5.1. Monitoring of project's KPIs related to the Accelerator

A set of Key Performance Indicators (KPIs) were defined at project launch and has been tracked throughout the second year to monitor the performance and impact of the Accelerator:

Table 5. KPI related to SO3 Deliver PDA services to Catalan bioeconomy projects

KPI	Result so far	Final target	Assessment
Number of bioeconomy projects applying for PDA services	20	20	Achieved
Number of bioeconomy projects receiving PDA services	10*	10	Achieved
Total count of PDA services provided	44	50	On track
Satisfaction rating or feedback from bioeconomy projects participants regarding the effectiveness and value of the PDA services	4,5/5	>4	On track
Total number of investor-oriented business plan developed for bioeconomy projects	1	5	At risk
Invested projects	1	3	At risk
Money invested	7.4M€	30 M€	At risk

As of May 2025, the project has already met or is on track to meet most operational KPIs. In particular, the number of projects applying for PDA services has reached the targeted 20, and the number of Bioboosters receiving PDA services stands at 10 out of 10, fully meeting the objective. In total, 11 Bioboosters have been formally selected, but one was later abandoned before any services were delivered and is therefore excluded from the KPI count. The high satisfaction score from supported project (4.5/5) further confirms the value and relevance of the assistance provided, , although additional surveys will be conducted during RP3 to strengthen the data set.

KPIs related to investment mobilisation remain at risk. One investor-oriented business plan has been developed and one project has secured external funding (€7.4M). This reflects the early-stage nature of many Bioboosters and the reluctance of financial actors to engage with innovative bioeconomy ventures. In RP3, the project will prioritise the most advanced Bioboosters and reinforce its investor outreach activities. While full achievement of investment-related KPIs remains uncertain, targeted efforts are in place to maximise impact in the remaining months.

Progress in Year 2

During the second year of implementation, the Accelerator continued to attract new interest from circular bioeconomy initiatives and expanded its portfolio of supported projects. A total of eleven new applications for Project Development Assistance (PDA) services were received in Year 2, in addition to the nine applications received during Year 1. This brings the total number of bioeconomy projects applying to the Accelerator to twenty (see Section 3.1 for an overview of applicants).

Out of the 10 Bioboosters formally engaged during this second year, three projects (Bioboosters 1, 5, and 7) were discontinued—either by the promoters or due to lack of progress before services could begin. As explained in Section 3.2 (Biobooster Engagement Activities), these projects did not advance to the active support phase.

By the end of Year 2, seven Bioboosters remained under active development. Of these, five Bioboosters (1–5) were initiated during Year 1, and five new Bioboosters (6–10) were launched during Year 2, although one of them (Biobooster 7) was dropped.

While no Biobooster has been fully completed or closed during this reporting period, significant progress has been made in terms of service delivery and project maturity. Notably, Biobooster 4 (the wool processing plant) is approaching completion, and several others have entered advanced stages of technical validation, business model refinement, and investor outreach.

The focus of this second year has been on deepening support and delivering services, rather than finalising projects. This effort is expected to result in a robust pipeline of investment-ready Bioboosters entering Year 3, with increased potential for closure, replication, and long-term impact.

Investment Mobilisation

Bioboost targets to evaluate €150M of investment opportunities across approximately 30 projects. With the intention to deliver PDA services to half of these opportunities (€75M and 15 projects), the project endeavours to stimulate investment in 40% of the supported projects (€30M investment, projects).

The investment catalysed during Year 2 is related with Biobooster 4 (wool plant), that adds to Biobooster 2 (Alcarràs). The potential catalysed investement can be calculated or stimated based on the information collected from the advanced Bioboosters that are currently in our pipeline.

Table 6. Estimated investment catalysed by Bioboosters

Description of the current investment situation	Detailed inversion components	Estimated amount of investment	Executed amount of investment	Type of financing	Chance of investment being implemented

Biobooster 2 – Alcarràs Bioproductors	The full investment process is structured into 5 phases. **Phase 1 (biogas energy production)**, **Phase 2 (composting plant expansion)** and **Phase 3 (biomethane production)** are 100% executed. **Phase 4 (virtual pipeline)** is 60% executed,	**Phase 1: Biogas plant (70,000 tonnes): 3.5M€** - 0.5M€ equity - 1.8M€ bank loan - 0.4M€ IDEA grant (energy community grant) - 0.8M€ Generalitat (public admin) Biogas grant **Phase 2: Composting plant expansion (35,000 → 56,000 t): 0.645M€** - 0.321M€ bank loan - 0.321M€ NextGen grant **Phase 3: Biomethane expansion (70,000 → 126,000 t): 1.5M€** - 0.3M€ equity - 0.2M€ bank loan - 1M€ Generalitat Biogas grant **Phase 4: Virtual pipeline: 2M€** - 2M€ bank loan **Phase 5: Physical pipeline: 2.8M€** (initiated, pending permits) - 2.8M€ bank loan	10.445M€	**7.645 M€** (Phases 1–4 partially)	- 0.8 M€ equity - 5.121 M€ bank loans - 0.4 M€ IDEA grant - 1.8 M€ public grants - 0.321 M€ NextGen grant	Phase 5: Likely, pending permits All others: Executed

	expected completion by Dec 2025. **Phase 5 (physical pipeline)** has started procedures and is pending permits.					

Biobooster 3 –	The potential of investment has been estimated by the Bioboost consortium during the planning phase. Detailed planning and design are underway before moving to the implementation stage.	The investment includes various components: 2.5M€ for advanced digesters, designed for efficient breakdown of organic matter and biogas production; 3.5M€ for mini cryo-upgrading, enhancing biogas processing efficiency through cryogenic separation; 1M€ for cryogenics tanks, essential for storing and maintaining low temperatures; 2.7M€ for pyrolator, converting biomass into biochar and syngas;	~9.7M€	To be determined	Equity, Grant (not defined yet)	Likely, as Ametller is a company with proven experience.

Biobooster 4 – Wool processing plant	The investment for the wool processing plant promoted by Ajuntament de Tagamanent is 0.5 M€. Additional 0.3 M€ of investment are estimated for the auxiliary equipment.	The investment associated to the units for the wool valorisation including washing and processing of the clean wool is around 0.5 M€. Auxiliary equipment for the proper operation of the plan and complementary infrastructure is estimated in 0.3 M€.The total investment could reach up to 0.8 M€.	800.000€	800.000€	Grant: 500 k€ (ARC funding) + 300 k€ (local/national public funding).	Likely

Biobooster 6 – Plana de Vic Cooperative	The investment for CPV has been allocated for the enhancement of biogas production facilities. The project is in the planning phase. Detailed planning and design are underway before moving to the implementation stage.	This include the complete biogas plant with 4 digesters plus 2 more co-digesters, a desodorization system for remove gas emissions and a solid/liquid separation unit and valorization of both sub-products	~25 M€	0€	Cooperative (49%) and equity (51%) – tbc	Probably likely

Biobooster 8 - Insectius	According to the information provided the estimated inversion taking into the account the stage of the project is 1-5M €.	The estimated inversion includes the business model of optimizing insect farming through advanced technologies and a circular production model with a positive environmental impact	~1-5M€: €1M venture debt (25% counted as equity), €1M lead investor, and €1M impact fund and 2M€ tbd.	The €1M venture debt will be secured before the end of 2025.	Equity (100%)	Likely, pending private investors meetings

Biobooster 9 – Labin Products	The potential investment has been identified by Labin as part of its strategic scale-up plan. Following the near completion of its pilot plant, the company is now entering the planning phase for a larger industr	The investment includes various components: 1.5M€ for industrial-scale hydrolysis equipment to process animal by-products and extract bioactive peptides; 1M€ for odour control and environmental mitigation systems; 0.8M€ for logistics, storage, and handling infrastructure; 0.7M€ for product formulation, packaging, and lab QA systems; and 1M€ for regulatory certification, staff training, and market authorisation processes.	~5M€	0€	Equity (100%)	Probably likely

	ial facility. The second phase will depend on public funding and private co-investment opportunities to move toward full implementation.					

Biobooster 10 - Ecotros	Investment estimates are preliminary and dependon private funding for the pyrolyzer and public subsidies to support biomass collection logistics, as the biomass will come primarily from forests (public land).	The investment required includes several components: 2.5M€ pyrolyzer; 800k€ logistics and forestry biomass collection (and approximately 1M€/year in OPEX)	3-5M€	0€	Equity (100%)	Unlikely, there is still some uncertainty as the Biobooster project might not proceed as planned

The total potential investment is estimated at approximately €55 million, with €8.445 million already executed.

Services Delivered

Since the launch of the Bioboost Accelerator, a wide portfolio of Project Development Assistance (PDA) services has been offered to support bioeconomy projects at various stages of development. These services are designed to address the unique challenges faced by project promoters, spanning technical, financial, legal, and strategic dimensions. Rather than providing a standardised package, Bioboost tailors its support to each project's maturity, barriers, and systemic potential. This customised approach has proven crucial to help unlock investment opportunities, accelerate project readiness, and foster long-term impact across the Catalan bioeconomy landscape.

To date, **over 40 distinct PDA services** have been delivered through close collaboration with Bioboosters. These services reflect both the complexity of the projects supported and the evolution of the Accelerator's approach. The following list presents the range of services provided so far.

Table 7. List of PDA Services Delivered

Facilitation and Strategic Support	Business and Financial Services
1. Stakeholder engagement and facilitation of strategic meetings 2. Construction of storytelling as a communication tool 3. Mapping of systemic impact potential 4. Proposal of inter-project collaboration and shared infrastructure 5. Support in the formation of hubs or networks (e.g., wool value chain) 6. Market identification for bio-based products 7. Search and contact of key stakeholders (public, private, R&D) 8. Coordination of Public-Private Partnership (PPP) discussions 9. Justification of systemic impact and support in positioning the project territorially 10. Support in overcoming social acceptance barriers (e.g., through narrative, dialogue, or community engagement strategies) 11. Mapping of aligned initiatives or actors for potential synergies (e.g., clustering opportunities) 12. Mapping of local/regional biomass flows relevant to the project scope	13. Circular business model development 14. Scenario-building and sensitivity analysis 15. Investment structure planning and CAPEX/OPEX assessment 16. Exploration of private and public financing opportunities 17. Economic feasibility evaluation 18. Monetisation of ecosystem services through the business model 19. Market segmentation and end-user analysis 20. Evaluation of product-market fit and route-to-market 21. Definition of business cases under different valorisation routes 22. Business model integration of producers and local actors 23. Definition of selection criteria for accessing infrastructure 24. Analysis of demand-side incentives or procurement mechanisms (e.g. public purchasing of bio-based products) 25. Identification of niche markets for bioproducts or residual valorisation routes
Legal and Administrative Services	**Technical Services**
26. Legal and governance framework analysis	35. Technical feasibility study for processing plants (e.g., AD, pyrolysis)

27. Legal support for permits and regulatory processes
28. Assistance with urban planning compatibility and land-use assessments
29. Legal analysis for Intellectual and Industrial Property rights
30. Regulatory strategy for bio-based inputs and activities
31. Grant application support and liaison with public administrations
32. Analysis of compliance pathways under new EU regulations (e.g. RED III, CAP, CBAM)
33. Recommendations for entity restructuring to enable investment-readiness (cooperative, SL, etc.)
34. Identification of regulatory requirements and classification of bio-based materials
36. Evaluation of valorisation scenarios for various feedstocks
37. Evaluation and selection of appropriate biotechnologies
38. Proposal of additional feedstock sources and biomass mapping
39. Process optimisation recommendations
40. Analysis of alternative technologies for digestate treatment
41. Recommendations for odour reduction and minimising social/environmental impact
42. Review of input logistics, including transportation, storage and shredding equipment
43. Co-product valorisation and by-product stream strategy
44. Technical review of circularity performance and expected resource recovery outputs

Satisfaction and Feedback

Unlike in Year 1, no new formal satisfaction surveys or structured feedback mechanisms were conducted in Year 2. This is because no Biobooster was fully completed during this period. In Year 1, feedback was collected from closed Biobooster; however, in Year 2, the focus remained on service delivery and project advancement. Informal feedback collected during ongoing interactions indicates a high level of satisfaction, but formal data will be gathered once Bioboosters such as the wool processing plant reach completion. Looking ahead, the project aims to close several Bioboosters in Year 3, at which point structured feedback mechanisms will be reinstated to assess the impact and quality of support provided.

5.2. Monitoring of Bioboosters' KPIs

The evaluation of the project impacts and their performance is key to prove the convenience and viability to boost the Bioeconomy in Catalonia and other regions. An effective monitoring will not only serve to calculate the impact but will also help to effectively communicate the project results. As described in previous deliverables (D2.2 and D3.1), the Bioboost project has decided to consider quantifiying the indicators shown in Figure 4, when relevant for each one of the Bioboosters.

Until now the only impact assessment that has been performed is for Biobooster 2 (see section 3.2 for the results), and for Biobooster 4 is ongoing. The impact assessment will be done for all Bioboosters once they are more advanced.

The methodology used has been the following:

Environmental Impact Assessment:

To evaluate the environmental impact of the four scenarios developed for the Alcarras project, we will conduct an attributional cradle-to-grave life cycle assessment (LCA) study following ISO 14040:2006

guidelines. This study will encompass foreground and background processes necessary for material and energy supply. Environmental impacts, focusing on climate change (measured in kg CO2-eq), will be assessed using the Environmental Footprint v3.1 method established by the EU Commission.

Economic Impact Assessment:

To assess the economic impact, a cost-effective assessment will be performed based on a detailed bill of materials (BoM). The social discount rate (SDR) is a key parameter in this analysis. Therefore, SDR-dependent economic indicators such as internal rate of return (IRR) and net present value (NPV) will be determined and analysed. The cost analysis will define the economic feasibility of each project.

Job Creation Assessment:

To measure job creation, we will employ two methods: jobs created per kilogram of product, and sporadic jobs created per kilogram of product. Job creation will be categorized into direct (e.g., production process, research and development) and indirect (e.g., supply chain, land workers, service providers) roles to quantify their impact on the projects.

Figure 3. Bioboost indicator's key areas and KPI examples

Production and Consumption

- Virgin material extraction
- Energy consumption
- Share of renewable energy
- GHG emissions by sector (NACE activity)
- Change in land use / coverage – recovery of idle land
- Increase of organic carbon in soil

Waste Management

- Municipal waste
- Industrial waste (t of waste turned into resources)
- Recycling rate of municipal waste
- Recovery rate of waste (t of materials recovered and reused)
- Incineration rate
- Landfilling rate (t reduced)
- Waste intensity (t/GDP)

Resource Efficiency

- Circular material use rate
- Use of forestry resources
- Use and valorisation of co-products of the agri-food, aquaculture, and fishing value chain

Competitiveness and innovation

- Direct jobs created in the circular economy
- Jobs for youth in rural sector
- Social inclusion
- Value added generated by the sectors
- New business in agri-food sector based on circular bioeconomy
- Market generated
- Start-ups and scale-ups in bioeconomy
- Investment needed
- Type of project
- Stakeholder types involved
- Type of barriers identified

Governance

- No. of partnerships with municipalities/distribution or financial institutions willing to collaborate on a bioeconomy initiative
- Financial resources mobilised
- Legal and regulatory barriers to bioeconomyremoved
- Legislative and normative obstacles identified and resolved
- New types of waste classified as byproducts and with end-of-waste status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