

LIFE BIOBEST

GUIDING THE MAINSTREAMING OF BEST BIO-WASTE RECYCLING PRACTICES IN EUROPE

Layman's Report

June 2025



Co-funded by
the European Union



Core LIFE BIOBEST Staff

ENT	Gemma Nohales, Ignasi Puig & Mike Stinavage
CIC	Vera Brambilla, Alberto Confalonieri, Michele Giavini, Irina Krutova, Eva María López & Marco Ricci
ACR+	Jean-Benoît Bel & Beray Cayli
ECN	Stefanie Siebert & Steffen Walk
ZWE	Nanna Bille Cornelsen, Enzo Favoino, Manon Jourdan & Jack McQuibban

LIFE21-PRE-ES-LIFE BIOBEST - 101086420

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Guiding the mainstreaming of best bio-waste recycling practices in Europe

2.5-year project, start date 01/01/23

CALL LIFE 2021-PREP-NATURA, NATURE AND BIODIVERSITY

LIFE Preparatory Projects – Projects addressing ad hoc Legislative and Policy Priorities (PLP)

Preparing the basis for EU guidance and standardization on closing the gap in the biological cycle to enrich soils with high quality compost from collected organic waste

A soil focused project from its genesis. Closing the organic matter cycle (close the nutrient and carbon circle) with high quality compost and digestate from separately collected bio-waste to improve soils and agricultural production

Project Total Eligible Costs: 1,664,600.07, Funding Rate: 90%, Maximum Grant Amount: 1,498,140.05€

Introduction

The EU obligation on the separate collection of bio-waste came into force at the start of 2024, increasing the availability of source-separated bio-waste for composting and anaerobic digestion. Over the course of 30 months, LIFE BIOBEST provided guidance and support for optimising implementation of the EU obligation with evidence from high performing schemes and the definition of performance indicators as to achieve the recycling targets of the Waste Framework Directive and the landfill diversion goals of the Landfill Directive.

Bio-waste represents the largest stream of municipal waste (30-40%) and is a cross-cutting driver with ramifications in many sectors such as soil health, emissions, agriculture, fertilisers, etc. The EC has recently acknowledged that 60 and 70% of EU soils are classified as unhealthy, being the area more affected. The EC has committed to reverse this tendency and improve the level of organic matter in the soil by returning compost and digestate from bio-waste.

In general, bio-waste management is in its infancy. The 2nd EU Early Warning Report showed the presence of very different levels of implementation and generally low outcomes in terms of bio-waste capture (especially food waste). Only 9 of 27 Member States (MS) are on track to meet 2025 recycling targets,

being the Southern and Eastern MS specially lagging behind.

To this end, LIFE BIOBEST contributed to the sustainable and efficient management of the whole bio-waste value chain with an unequivocal approach for sharing and transferring knowledge and providing recommendations to collectively evolve in the green transition.



Consortium Partners



ENT Foundation (ENT), the **lead coordinator of the LIFE BIBOEST project**, is a research centre based in Barcelona and dedicated to the elaboration, analysis, and implementation of public environmental policies. ENT has an extensive experience in the development of projects of consultancy, research and cooperation for development, which are carried out individually as well as integrated in consortia.



Italian Compost and Biogas Consortium (CIC) is a non-profit association with around 150 members fostering the recycling of bio-waste into high-quality products. Considering its technical background and the good performance of Italy in terms of bio-waste capture rate (125 kg/inhabitant/year) and quality compost produced (~2 Mt/yr), CIC is involved in many activities EU-wide showcasing how the bio-waste value chain can return organic carbon to the soil while generating energy carriers and green jobs.



Association of Cities and Regions for sustainable Resource management (ACR+) is an international network of cities and regions sharing the aim of promoting a sustainable resource management and accelerating the transition towards a circular economy on their territories and beyond. The network currently counts over 100 members, mainly local and regional authorities as well as national networks of local authorities representing around 1100 decentralized public authorities.



European Compost Network (ECN) is a membership organisation with 66 members from 27 European Countries, promoting sustainable recycling practices in composting, anaerobic digestion and other biological treatment processes of organic resources. It work with practitioners, researchers, technicians and policy makers to deliver integrated organic waste recycling solutions that generate high quality products for the benefit of the environment and the users of the recycled products.



Zero Waste Europe (ZWE) is a dynamic network of 35 local and national communities, organisations, dedicated leaders, experts, and change agents from across Europe. Our collective mission is to collaborate towards the sustainable preservation of resources, the prevention, and elimination of waste in our society.

LIFE BIOBEST at a glance: Work Packages

WP1: Project management and coordination



T.1.1. Setting up project coordination, quality assurance and risk management - ENT

T.1.2. Administrative, financial and legal management and coordination - ENT

T.1.3. Advisory board creation and consultation - ACR+

WP2: Definition of bio-waste indicators and data analysis



T.2.1. Identification and analysis of existing data - CIC

T.2.2. Identification of KPIs - CIC

T.2.3. Statistical analysis of existing databases - ENT

WP3: Set of guidelines



T.3.1. Separate collection analysis - CIC

T.3.2. Governance and economic incentives analysis - ENT

T.3.3. Compost and digestate production and quality analysis - ECN

T.3.4. Analysis of communication and engagement practices - ZWE

WP4: Networking and co-creation



T.4.1. Analysis of identified best practices with frontrunners - CIC

T.4.2. Co-creation process with key stakeholders to identify barriers for implementing BPs - ACR+

T.4.3. Review of key outputs of the project - ECN

T.4.4. Monitoring of on-going strategies - CIC

WP5: Policy and regulatory recommendations for bio-waste



T.5.1. Identifying and analysing policy and regulatory barriers for the production of high quality compost and digestate from bio-waste - ENT

T.5.2. EU Comprehensive guidance preparation - ZWE

T.5.3. Design of a guidance in the form of decision support tree for local and regional authorities taking into account different framework conditions - ENT

T.5.4. Proposal for EU standards for bio-waste entering recycling processes for high-quality compost and digestate - ECN

WP6: Communication and dissemination



T.6.1. Development of the communication and dissemination strategy - ZWE

T.6.2. Development and implementation of the communication and dissemination plan - ZWE

T.6.3. Design and produce communication and dissemination activities - ZWE

T.6.4. Stakeholder's capacity building on the operationalisation of an efficient bio-waste collection system - ZWE

WP7: Sustainability, replication and exploitation of project results



T.7.1. LIFE BIOBEST Decision support web tool development - ENT

T.7.2. Testing LIFE BIOBEST Decision support web tool - ENT

T.7.3. Definition of the transferability and replication strategy - CIC

T.7.4. Development of the exploitation and sustainability strategy - ENT

Project Summary and Key Results

To ensure the development of bio-waste management best practices and the production of quality compost and digestate for soil applications, while minimising any negative effect and effectively closing the loop, a comprehensive analysis is required regarding bio-waste management strategies, instruments and management schemes and their results.

LIFE BIOBEST project outcomes identify and validate the current Best Practices and management instruments along the bio-waste management chain (from generation to treatment) that allow the production of high-quality compost and digestate. The project focuses on supporting both upper and lower levels of governance, including policymakers, waste management organisations, and technical practitioners, to facilitate the widespread adoption of recognised Best Practices and instruments. By addressing administrative, economic, organisational, and technical barriers that both Member States (MS) and local authorities face in complying with the mandate for separate collection, targets for the preparation for use and recycling will be within reach.



Main LIFE BIOBEST outputs include:

- **D2.1 Improved and homogenised datasets on municipal bio-waste management** supports the establishment of a series of reference Key Performance Indicators (KPIs). The dataset contains fundamental information on bio-waste collection and treatment in nearly all 27 MS, along with detailed data on kitchen and garden waste collection per capita at the municipal level for Italy, Denmark, and Catalonia.
- **D5.2 Policy brief** identifies the gaps in the regulatory framework and systemic barriers obstructing efficient bio-waste management with high capture rates of high-quality material.
- **D3.1 Guideline on separate collection** provides an overview of the different bio-waste separate collection schemes and assesses the pros/cons. This guideline includes in an annex, "Best practice cases on bio-waste collection" that focus on collection from households and other producers in various contexts. Best practice cases on bio-waste collection" that focus on collection from households and other producers in various contexts.

- **D3.2 Guideline on governance and economic incentives** discusses the governance tools and economic instruments needed to improve management schemes. The guideline presents these instruments alongside examples of their application and includes an analysis of the economic viability of best practices in bio-waste management from separate collection to treatment.
- **D3.3 Guideline on quality compost and digestate** breaks down the treatment technologies and resources that support the production of compost and digestate. The guideline provides insights about the processing options, analysis of product characteristics, quality assurance systems as well as related EU legislation and the ECN's Quality Assurance Scheme.
- **D3.4 Factsheets on the analysis of best practices in communication and engagement from various countries** delves into the topic of public communication and education. It includes an analysis of experiences from frontrunners and provides insights into the impact of communication activities, highlighting the need for well-coordinated outreach efforts combined with convenient collection systems to encourage citizen participation.
- **D5.3 Proposition of quality standards** aims to establish harmonised quality standards for bio-waste entering recycling processes across EU MS. It includes recommendations for a standardised methodology for quality assessment via waste compositional analysis and/or visual inspection, as well as a control value for impurities in bio-waste. This report was drafted with regards to §22, point 3 of the Waste Framework Directive (WFD).
- **D5.4 Comprehensive guidance for the EU** presents key policy recommendations to strengthen the EU legal framework for bio-waste management. Drawing from extensive research and stakeholder consultation, this document outlines three interconnected areas for improvement: boosting effective models for separate collection and recycling, promoting reliable markets for compost and digestate, and enhancing monitoring and enforcement of bio-waste regulations.
- **D2.3 Assessment matrix of best practices** evaluates and consolidates contextual factors that affect bio-waste management, providing in-depth descriptions of each. Factors are placed beside recommendations and theoretical scenarios, which stakeholders can use to compare to their own context.
- **D5.1 Decision support trees** function as a tool for municipalities and regional authorities to evaluate their specific difficulties and context. Following a preliminary self-assessment, the decision support trees disaggregate barriers that inhibit bio-waste implementation, pairing them with resources and recommendations from LIFE BIOBEST outputs.

Network

The LIFE BIOBEST Advisory Board, created in the first semester of the project, is composed of 12 European expert organizations in the area of bio-waste management. The entities represent all corners of Europe and various levels of governance and areas of expertise along the bio-waste value chain.

Throughout the duration of the project, the Advisory Board was regularly consulted and their insights incorporated into the LIFE BIOBEST outputs.

Figure 1. Map of Supporting Stakeholder Network in Europe



Table 1. LIFE BIOBEST Advisory Board

ORGANIZATION	COUNTRY
• Ramon Plana Gonzalez-Sierra	ES
• Waste Agency of Catalonia	ES
• Composting & AD association of Ireland (Cré)	IE
• Hungarian Quality Compost Association	HU
• HOOP (Project)	EU
• European Biogas Association	EU
• FER-PLAY (Project)	EU
• European Environment Agency	EU
• Bundesgütegemeinschaft Kompost BGK e.V.	DE
• Estonian University of Life Sciences	EE
• Municipal Waste Europe	EU
• Zero Waste Italy	IT

The LIFE BIOBEST Supporting Stakeholders' Network is made up of organisations and experts around the globe interested in exchanging insights and support with LIFE BIOBEST.

Over 100 stakeholders participate in the network, staying up to date with the project's activities and events as well as receiving newsletters and specific communications.

Events and Capacity Building

Events, in addition to outputs, are at the heart of the dissemination of LIFE BIOBEST results as they provide a platform for direct interaction, facilitating networking, fostering collaborations and enabling the exchange of ideas. The interactions carried out at events and co-creations have contributed to build trust and credibility on LIFE BIOBEST outcomes, while making it easier to communicate complex information, exchanging Best Practices and collect valuable feedback.

In addition to holding project events, the LIFE BIOBEST consortium participated in dozens of external events. These events ranged from webinars, conferences and lectures to presentations such as the COP 25 in Azerbaijan, 12th International Conference on Sustainable Solid Waste Management in Cyprus and Ecomondo International Circular Economy Fair in Italy.

Figure 2. Photographs from LIFE BIOBEST Capacity Building Event in Barcelona, Spain, in October 2023



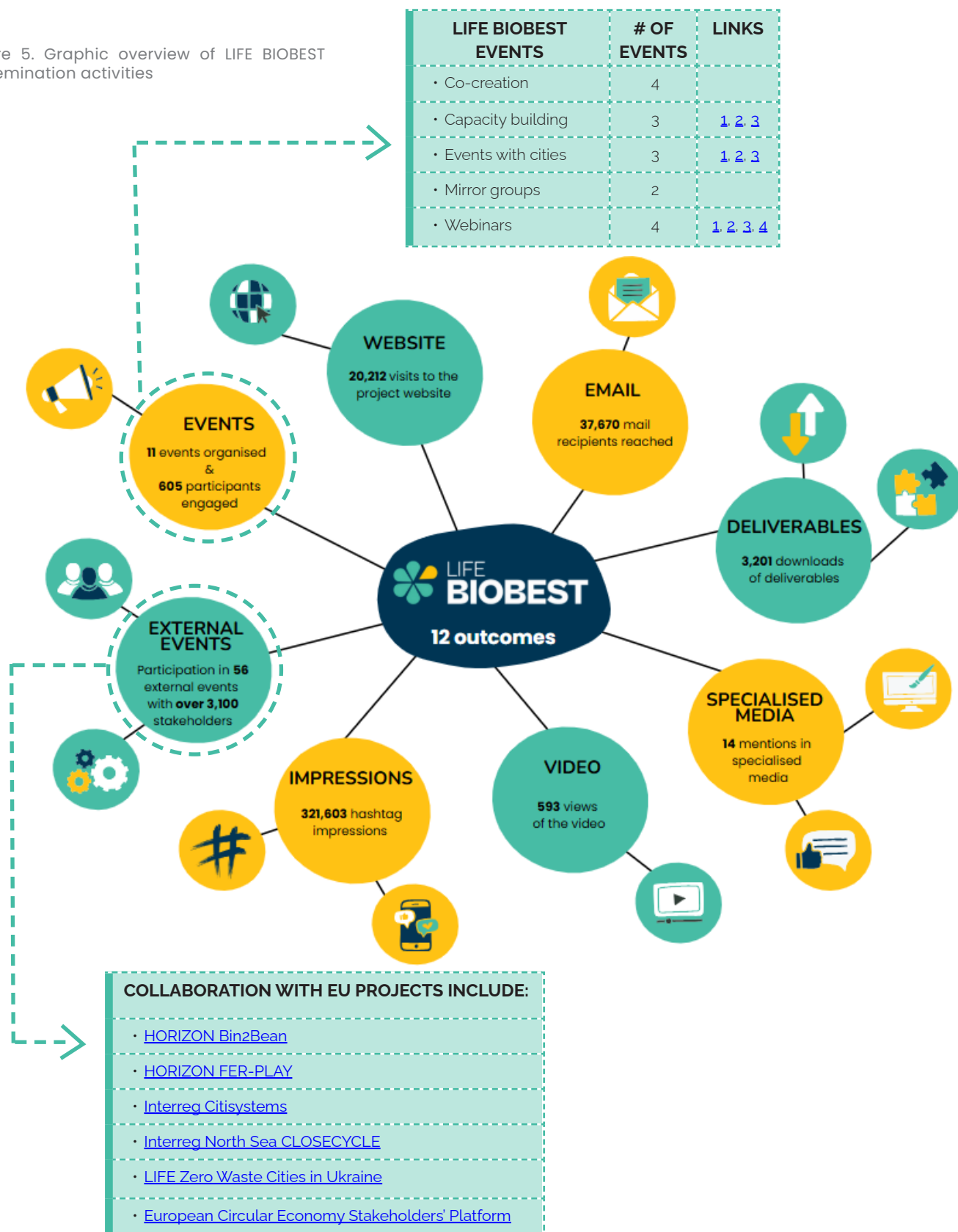
Figure 3. Photograph from LIFE BIOBEST Capacity Building Event in Lyon, France, in March 2024



Figure 4. Photograph from LIFE BIOBEST Capacity Building Event in Lyon, France, in March 2024



Figure 5. Graphic overview of LIFE BIOBEST dissemination activities



Policy Recommendations

To promote the policy recommendations outlined in **D5.4 Comprehensive Guidance for the EU**, the consortium created a short **video** and two infographics. The first is a visualization of economic incentives. The second is a summary of the LIFE BIOBEST policy recommendations. Included are five key recommendations:

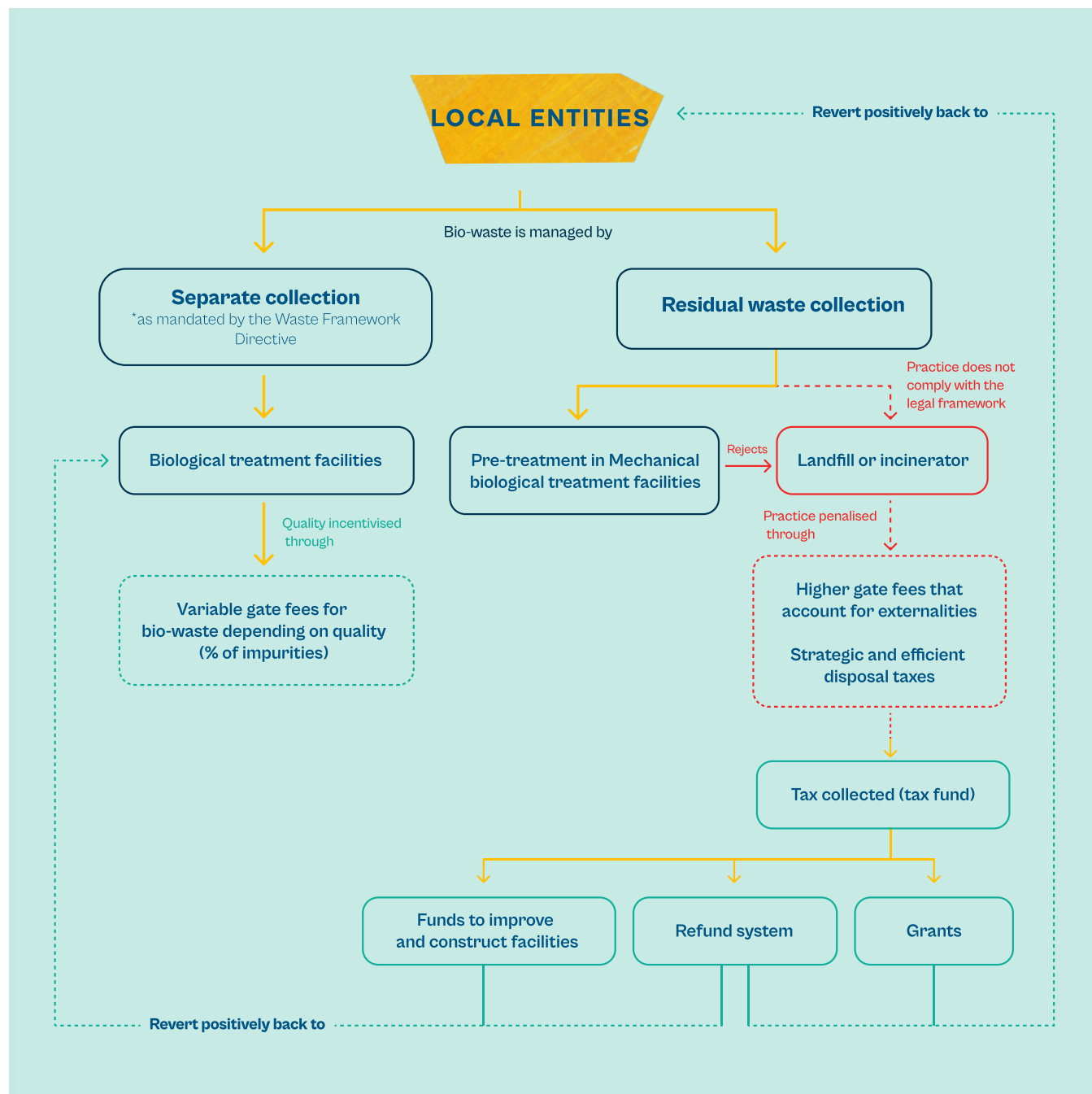
- 1 Adopt legally binding targets linked to the amount and quality of bio-waste captured,
- 2 Promote economic instruments that realign incentives, making bio-waste management more cost effective,
- 3 Strengthen reporting requirements to monitor bio-waste management,
- 4 Promote a reliable market for compost and digestate, increasing their purchase and application on soils across the EU and
- 5 Equip all levels of governance with the tools and skills needed to successfully implement bio-waste separate collection.

Figure 6. Stills from the LIFE BIOBEST video



Figure 7. Economic instruments infographic: landfill and incinerator tax & refund scheme (below)

Figure 8. LIFE BIOBEST Policy recommendations infographic (next page)



POLICY RECOMMENDATIONS TO STRENGTHEN THE EU LEGAL FRAMEWORK FOR EFFICIENT BIO-WASTE MANAGEMENT

■ Establish legally binding targets on the amount of bio-waste found in residual waste per year

■ Establish legally binding targets on the quality of bio-waste entering the recycling process by setting a limit on accepted physical impurities

■ Establish legally binding targets on the limit of residual waste generation per inhabitant (which indirectly improves bio-waste collection)

Increase the cost-competitiveness of bio-waste management

1. Disincentivise the amount of waste sent to landfills and incinerators across EU Member States through:
 - a. Strategic disposal taxes to incinerators and landfills
 - b. Higher landfill and incineration gate fees which include all the costs and externalities
 - c. Refund system associated with the landfill/incineration tax (tax fund)
 - d. Variable gate fees for bio-waste
 - e. Tighter enforcement of the obligation on the pretreatment of waste (stipulated by the Landfill Directive 99/31)
2. Avoid any funding of lowest tiers in the waste hierarchy, and channel funds towards the highest ones through:
 - a. Stricter monitoring of EU spending policies
 - b. The allocation of EU funds aligned with the three legally binding targets
 - c. Related procedural arrangements for funds to highest tiers aligned and simplified across all Member States
3. Encourage the implementation of Pay-As-You-Throw and/or Save-As-You-Throw systems
4. Require that user-paid waste management charges include the full cost of the service
5. Integrate waste incineration fully into the EU Emissions Trading System starting in 2028

Develop reliable markets for compost and digestate

1. Explicitly recognise high-quality compost and digestate as essential components of the Soil Monitoring Law through:
 - a. Prioritised use of quality-assured compost and digestate in Soil health and carbon farming certification methodologies
 - b. Mandated sustainable soil management practices
2. Recognise and support the vital role of bio-waste-derived organic fertilisers and soil improvers in carbon farming practices and in replacing mineral fertilisers, within key legislations: the Certification Framework for Carbon Removals, the future Circular Economy Act, the Common Agricultural Policy and in the EU Nature Restoration Law
3. Promote the adoption of Rural Development Plans to establish subsidy systems for farmers using organic fertilisers to improve soils and sequester carbon, prioritising high quality compost
4. Address and revise the references to Animal By-Products Regulation in the Fertiliser Product Regulation, which are blocking its adoption by local bio-waste recycling plants
5. Set up and promote an EU-wide Quality Assurance Scheme for compost and digestate such as the one promoted by European Compost Network

Ensure effective monitoring and enforcement of current EU bio-waste regulations in Member States

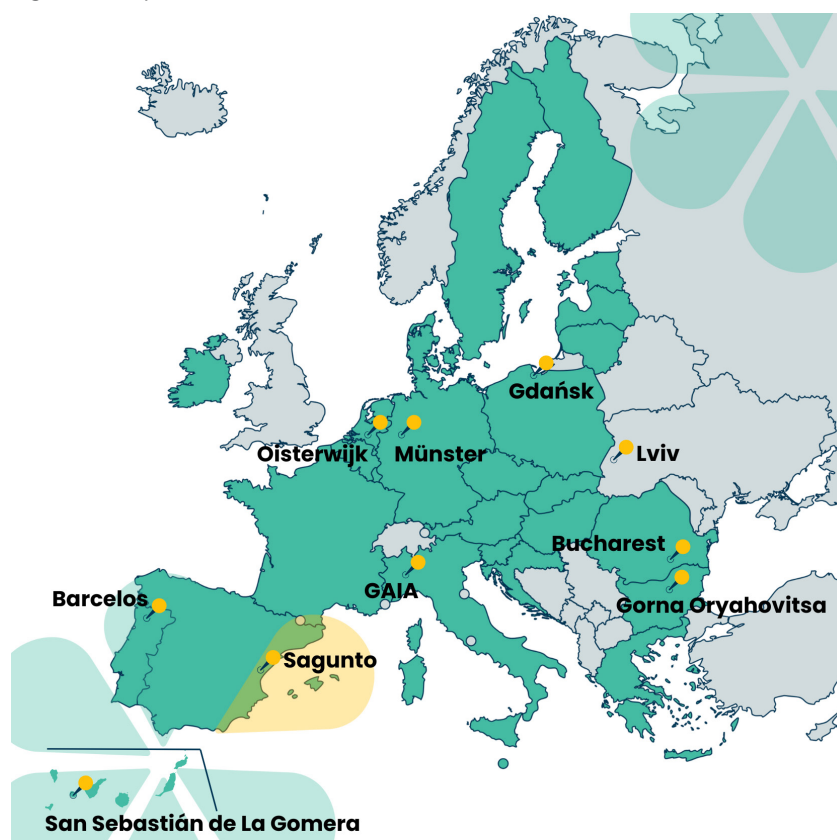
1. Introduce a legally binding requirement for local authorities and treatment sites to collect and report bio-waste management data annually and ensure that this data is compiled and provided to regional and national institutions
2. Homogenise reporting requirements on separately collected and recycled bio-waste through:
 - a. Legal obligation alongside a method and frequency of compositional analysis of residual waste
 - b. Expanded reporting requirements to include the monitoring of impurities in separately collected bio-waste
 - c. Definition and inclusion of KPIs in Member States reporting obligations, prioritising those that support bio-waste target implementation and monitoring impurities in separately collected bio-waste

Technical Trainings

LIFE BIOBEST has allocated significant resources to facilitate the transfer of knowledge generated through project activities, as well as to disseminate best practices identified throughout its implementation. One of the key instruments for promoting the adoption of LIFE BIOBEST solutions has been the provision of tailor-made technical support services to local administrations, aimed at assisting them in the development or enhancement of their bio-waste management systems.

The LIFE BIOBEST technical support services have been rolled out from January 2024 to June 2025 engaging 10 municipalities (more than 20 representatives of public authorities) into fruitful discussions, according to the time of request of each of them and following their availability of data and information to identify the gaps or need for improvement for each case.

Figure 9. Map of the Technical Assistance



Final Event

The final LIFE BIOBEST event on 5 June 2025, organised as an official EU Green Week partner event, gathered over 60 participants in Brussels. The event brought together representatives from European Union institutions; regional, and local officials; waste company representatives; civil society organisations and academia working on bio-waste management.

The feasibility/practicality of implementation of those main recommendations was examined by local frontrunners and bio-waste experts in the event's panel discussions. Lessons learned for the future of bio-waste management in Europe included:

- EU legally-binding targets on the quantity and quality of the bio-waste captured along with improved monitoring systems.
- Implementing of a set of economic and fiscal instruments – such as increased landfill and incineration taxes or tax refund schemes – to increase the cost-competitiveness of bio-waste management.
- Key measures to support the production, marketing, and application of high-quality compost and digestate in agriculture, landscaping and the growing media industry.
- Cascading governance and knowledge transfer to the local level.

Figure 10. Photos from LIFE BIOBEST final event



Figure 11. Photos from LIFE BIOBEST final event



Figure 12. Photos from LIFE BIOBEST final event



Future Keys to Success

To promote the transformation of LIFE BIOBEST outputs into impactful and lasting outcomes for society and waste sector, the consortium has set forth an afterlife strategy. Meaningful exploitation paves the way to additional policy recommendations, the improvement of bio-waste management and the promotion of measurable impacts on the economy and the environment.

- Providing the necessary resources to include these after-project activities as part of their usual actions.
- Locating opportunities for further collaboration with public entities (EU, national/regional) and/or private foundations.
- Applying for future EU project calls related to bio-waste and bioeconomy.
- Continue the relationship and channels of collaboration among project partners.
- Continue the relationship with CINEA and EC-DGs to promote the outputs of the project, exchange knowledge and information and generate synergies.
- Follow-up the implementation and results of the afterlife activities of the project with specific meetings.

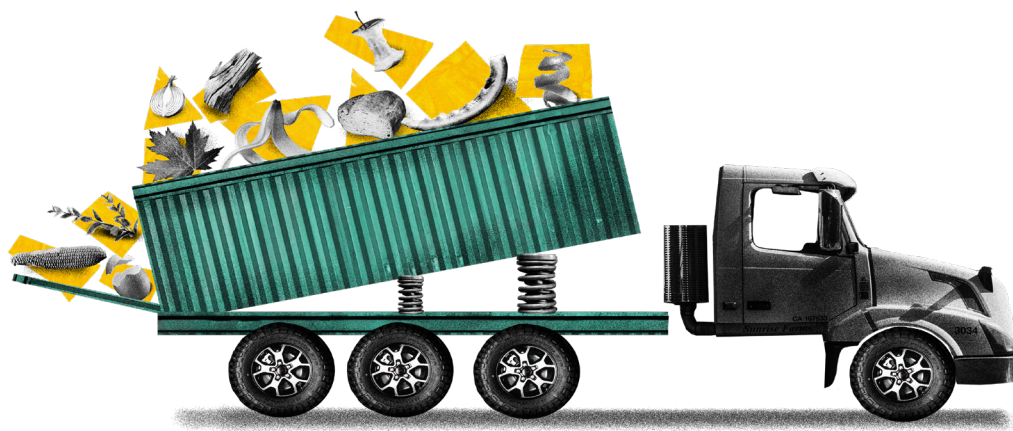
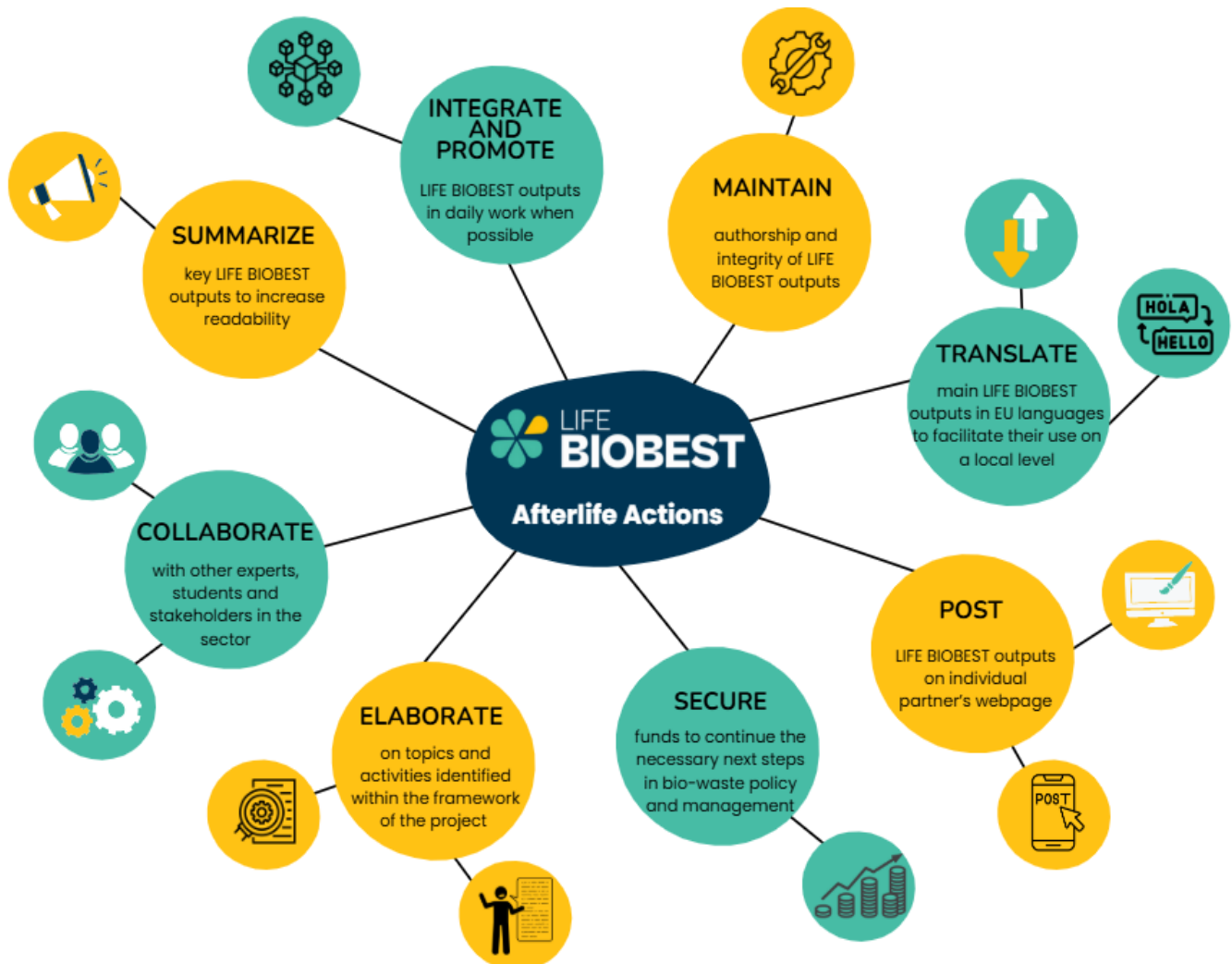


Figure 13. Core actions, LIFE BIOBEST afterlife strategy



Acknowledgements

LIFE BIOBEST has produced a series of publications on Best Practices and efficient instruments, the data behind these successes, and the key policies that have enabled Europe's best performing bio-waste management systems. The aim is clear: to inspire and facilitate replication of these models across Europe.

The work achieved would not have been possible without the numerous experts, stakeholders, Advisory Board members, and the consortium partners. We kindly thank you for your contributions.

In addition to the core LIFE BIOBEST staff mentioned in the early pages of this document, we would like to extend a special thank the following individuals for their participation:

- ENT: Luís Campos-Rodríguez, Rosaria Chifari, Verónica Martínez, Francisco Navarro, Raimon Ràfols and Mar Santacana.
- CIC: Massimo Centemero
- ACR+: Françoise Bonnet, Francesco Lembo, Lauriane Noirot
- ECN: Riccardo Gambini & Aline Granjard
- ZWE: Seán Flynn, Theresa Mörsen, Ana Oliveira & Janek Vahk



Figure 14. Photo from LIFE BIOBEST final event





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