D8.6

Report on the HOOP Cities Conference

ACR+

The HOOP project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101000836

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Author(s)	Jean-Benoit Bel & Serena Lisai (ACR+)
Reviewer(s)	Elisa Gambuzzi (CETENMA)
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Table of contents

The HOOP project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101000836

The HOOP project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101000836

List of Tables

The HOOP project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101000836

List of Figures

The HOOP project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101000836

List of acronyms

Acronym	Description
ABP	Animal By-Products
BC	Biowaste Club
CCRI	Circular Cities and Regions Initiative
DG SANTE	Directorate-General for Health and Food Safety
DG RTD	Directorate-General for Research and Innovation
EC	European Commission
EU	European Union
LHCRs	Lighthouse Cities and Regions
NRW	National Replication Workshop
PDA	Project Development Assistance
SCP	Single Cell Protein
TRL	Technology Readiness Level
UCBH	Urban Circular Bioeconomy Hub

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1. Executive summary

The HOOP Cities and Policy Conference was held on 4-5 June 2024 in Brussels. Over 130 people registered and 34 representatives of the members of the HOOP Network of Cities and Regions joined the HOOP partners and external attendees for a 2-days event: 97 people at the Policy Conference (4th June) and 92 people at the Cities Conference (5th June). The conference presented the main results achieved by the HOOP Lighthouses, built stronger connections and collaboration opportunities for the HOOP cities and regions and constituted an occasion to gather key information and dialogue about regulatory, economics and policy topics from the perspective of solution providers, EU entities and territories.

Structured as a mix of plenary sessions and thematic workshops, the HOOP conference was a remarkable opportunity to present the final results of the project and the experience of the Lighthouses, highlighting barriers / drivers for local players aiming to implement urban circular bioeconomy innovative solutions. The active involvement of keynote EU-level speakers such as Lucie Blondel (DG RDT) and Markku Markkula (former President of Committee of the Regions and current President of Helsinki Region) clarified the key role of bioeconomy within the European Union actions settled by the Green Deal. Furthermore, the conversation has been enriched by the involvement of high-level external relevant federations active on the topic such the European Compost Network, the European Sustainable Phosphorous Platform, the European Investment Bank, CCRI, and The European Bioeconomy Bureau.

The event welcomed testimonies from 4 Lighthouses (Porto, Münster, Bergen and Almere) and 4 Network members (Brussels Region, Krakow Municipality, Maia Ambiente and FADI). Furthermore, 6 technical partners (CETENMA, ACR+, Bax&Co, CSCP, RdA and Sara Bedin-Smart Procurement) actively participated presenting and moderating sessions. A set of 4 interactive workshops brought together cities sharing similar interests and challenges to discuss on success stories, difficulties and solutions. Finally, the event was ended with a call for continuation of the network of cities and regions, which gathered positive feedback from the HOOP members.

Among the many takeaways, we list the following discussion points from the Policy Conference:

- **The ABP regulation was listed as one of the key legal barriers**. Many biowaste valorisation solutions do not meet the criteria set by the ABP Regulation, forcing the solution developer to undergo the application for “alternative method for treatment of ABP”. The process takes more than one year: it requires studies to be submitted to the European Food Safety Agency, that gives a scientific opinion to DG SANTE that eventually adopts a measure authorising the alternative method. During the Conference, HOOP Lighthouses and external experts described different methods and strategies developed to overcome this barrier.
- **The ABP Regulation is regarded a very complex, technical text**, making its interpretation challenging for national and regional sanitary authorities. This leads to a very strict application of the regulation, hindering the development of innovative processes. A set of guidelines promoted by DG SANTE aiming to explain and simplify the ABP Regulation for regional/national policy makers could help the work of regulators.

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- Despite the availability of many different instruments, financial and non-financial, to reduce the gap between circular bio-based projects and investors, **there are still many perceived economic and regulatory risks**. **Public Procurement of Innovation (PPI)** is regarded as a tool enabling tenderers to pull innovative solutions, even at low technology readiness level from the demand side, that most public players are unaware of. The European Investment Bank was part of the Conference and presented many different financial instruments and schemes where funding is complemented with loans.
- **Technology de-risking** can be achieved by focusing efforts in up-scale one project rather than multiply up-scale demonstration units through unconnected projects. Another de-risking mechanism seldom adopted is royalty-based share.

The main outcomes of the policy conference, and of the HOOP work on policy barriers and recommendations, are presented in **Annex 1: HOOP policy recommendations**.

The City Conference allowed to highlight the following elements:

- **Stakeholders' engagement dynamics** are essential to shape new recycling routes for biowaste, together with a well organised separate collection that brings a good quality of the biowaste. This requires constant communication, engagement, supervision and economic instruments. The relevancy of Biowaste Clubs has been acknowledged by all HOOP Lighthouses. To make this process effective, a proper selection of stakeholders according to the topic at stake is critical to get sufficient insight without making the process too complicated. Securing their participation on the long run can prove to be challenging, and it is essential to take the stakeholders' constraints to design the collaborative process.
- **Citizen science** can be an interesting way to involve the general public, gather feedback on their perspective regarding the topic at stake, but also make them reflect on their own behaviour.
- **Quality of sorted biowaste is a key parameter** to enable innovative valorisation routes. The technologies investigated by the HOOP Lighthouses generally requires high-quality feedstock, making waste collection a crucial step for local circular bioeconomy.
- **HOOP Network Members could share their own development on circular bioeconomy.** Many of them started to implement integrated biowaste management systems, some of them even displayed encouraging performances. Many indicated that they particularly welcome the opportunity of direct exchanges among local waste experts offered by the HOOP project, and the relevancy of getting testimonies from frontrunners to get prepared for upcoming challenges.

The last session consisted in a co-creation moment in which HOOP Members could share their views and propositions on the future of the Network via online questions. Overall, the session showed that there is a clear interest of the HOOP Members for the Network, the HOOP Hub and its services, with a focus on connections among members and in-person meetings and interactions. It also shows that many Members were unaware of the different services provided by the Network, someone that was also identified during a survey organised halfway through the project, and despite the inclusion of specific emails and presentation of each key service during the monthly HOOP Lunch Talks. In-person meetings such as the HOOP City conference seems to be a great way to make the Members more aware of the different services. There is also a willingness to reorganise another edition of the HOOP conference next year. However, it should be noted that few to no Members showed interest in paying for such services. Finding another project or initiative to continue these services might be the most realistic option.

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After the event, many have been the HOOP members that expressed both positive feedback on the conference and enthusiastic interest in being more involved in future HOOP activities.

Figure 1. Audience overview

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2. Policy Conference

THE CONFERENCE IN A NUTSHELL	**Focus**	**What barriers and drivers for the transition to local circular bioeconomy systems?**
	Date	Tuesday 4 Jun 2024 (Day 1)
	Duration	4 hours
	Place	European Committee of the Regions, Rue Belliard 99/101, Brussels (Room JDE 51 – 5th floor)
	Nº Participants	97

2.1. General presentation

The HOOP Policy Conference aimed to create an occasion for discussion on the main barriers and opportunities that currently affect, either positively or negatively, the transition toward circular bioeconomy projects and systems at local and regional level. The conference proposed both testimonies from local players implementing circular bio-based solutions and insights from high-level institutional organisations shaping the required framework conditions. The event then brought together HOOP partners, external experts and HOOP cities, both Lighthouses and HOOP Network members, to reflect on the framework conditions that these cities and regions faced to elaborate their circular bio-based projects.

2.2. Agenda

Time	Activity	Speaker
13:30 – 13:45	Opening and institutional greetings	Lucie Blondel, DG RTD
Session 1 – Most hindering regulatory barriers, economic consequences and policy requests		
13:45 – 14:00	**Introduction** | Landing the regulatory and economic challenges faced by cities and regions towards circular bioeconomy: *How the regulation was a challenge in the Project Development Assistance*.	Miguel Ángel Suárez (CETENMA)

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14:00 – 14:30	**Testimonies from local players** | Presentations of concrete case studies to understand how specific barriers concretely hinder local practices.	
	Animal by-product regulation barriers for the valorisation of biowaste into marketable fertilisers: Porto's LIPOR experience with compost.	Susana Lopes (LIPOR)
	Biochar from biowaste: the pyrolysis bottleneck experience by Münster's AWM	Christoph Baumann (AWM)
	Low-trophic organisms (SCP and insect) need better regulation and de-risking for investors – the case of Bergen's Greentech Innovators	Toralf Igesund (BIR)
14:30 – 15:15	**Panel discussion** | How to unlock the identified regulatory barriers and their economic consequences. Policy requests and forecasts for amendments of the regulation framework; how projects and local players can contribute and speed up the process. Discussion with the audience. *Moderated by Jean-Benoît Bel, ACR+*	Jean-Marie Savino (Eco Circulaire) Nicolas Scherrier (Brussels Environnement) Riccardo Gambini (European Compost Network)
15:15 – 15:45	**Coffee and Networking**	
	Session 2 – Towards policy drivers	
15:50 – 16:00	**Introduction** | Circular Bioeconomy enablers for HOOP projects	Leandro Vaz (RdA)
16:00 – 16:20	**Testimonies from local players** | Presentations of concrete case studies to understand how specific regulations can support and boost local practices. In particular, the session will focus on:	
	Almere Municipality: How policy leads to increased local stakeholder engagement in Almere's waste collection system	Peter de Boer (Almere Municipality)
	Alentejo Region: How a region can successfully involve the private sector in circular economy schemes.	Elsa Nunes (Irradiare)
16:20 – 17:00	**Panel discussion** | How upcoming policies and funding schemes plan will further enable circular bioeconomy. Discussion with the audience. *Moderated by Elisa Gambuzzi (CETENMA)*	Sara Bedin Andrea Accorigi (CCRI CSO)

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		Robert Van Spingelen (European Sustainable Phosphorous Platform) Jonas Byström (EIB)
Conclusions		
17:00 – 17:30	Keynote by the European Bioeconomy Bureau and closure	David Robert Newman (European Bioeconomy Bureau) Gemma Castejón (CETENMA, HOOP Coordinator)

2.3. Main outcomes from sessions

2.3.1. OPENING FROM DG RTD (EUROPEAN COMMISSION)

Lucie Blondel (DG RTD) started with a reminder about the current European policy background, with the Green Deal as a "game changer" for the transition from a linear to a circular economy, along with the Circular Economy Action Plan. The Eco-design for Sustainable Products Regulation was also mentioned as a strong instrument to support circular consumption. The next work programme includes 90 M€ for circular economy topics, and the EU Research and Innovation funding programme currently funds projects aiming to support this transition for food, bioeconomy, natural resources, or the agriculture.

The Circular Cities and Regions Initiative was also introduced, as a flagship scheme supporting the implementation of "circular systemic solutions" at local and regional level, with the aim of structuring circular projects to roll them out in "bankable" projects.

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Figure 2. Introduction by Lucie Blondel (DG RDT)

2.3.2. MOST HINDERING REGULATORY BARRIERS, ECONOMIC CONSEQUENCES AND POLICY REQUESTS: UNDERSTAND THE BOTTLENECKS, TESTIMONIES AND PANEL DISCUSSION

2.3.2.1. Landing the regulatory and economic challenges faced by cities and regions towards circular bioeconomy

In this introduction, **Miguel Ángel Suárez** (CETENMA) explained that, to be feasible, any project requires different elements: technical feasibility (i.e. the whole process and associated technologies work), economic feasibility (the business model is viable, and the project can be financed), and a regulatory feasibility (the process and the products are legal). When assessing this last point, we can find one of these scenarios: under-regulation, over-regulation and balanced regulation, being the last the most desirable one, where the technology and product application are considered and properly regulated without concurrence of contradictory regulations.

Under- and over-regulation can either limit the appeal of the innovative circular bioeconomy solution or make its implementation too burdensome, leading to favour linear or more standard and regulated solutions (e.g. composting and anaerobic digestion), that generally are more likely to be financed.

When it comes to biowaste valorisation, among all challenging over-regulated aspects, Regulation No 1069/2009 (Animal by-products (ABP) Regulation)) was mentioned as one of the most faced legal barriers. Actually, household and catering waste are Category 3 ABP as per regulation definition. Although it does open

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opportunities for ABP valorisation via specific treatment methods that meet the end-point criteria (after which the biowaste ceases to be classified as ABP), most biowaste valorisation solutions don't meet the criteria, forcing the solution developer to undergo the **application for "alternative method for treatment of ABP**". The process takes years: it requires studies to be submitted to the European Food Safety Agency, that gives a scientific opinion to DG SANTE that eventually modified the regulatory framework to include the biowaste treatment among those that meet the end-point criteria.

Another challenge can be found in the under-regulation of secondary hydrolysed growing-media for biotechnology application. Ambiguities need to be tackled **to unlock the EU biorefinery potential**.

What are the consequences at a higher level? **No regulatory feasibility of innovative biowaste valorisation routes = No Access to finance**. Territories will continue to bet on composting and biogas, leaving innovation aside.

On the side of balanced, hence supportive, regulatory frameworks, we mention the Fertiliser Products Regulation (2019/1009), that explicitly mentions biowaste feedstock streams and provide process criteria that, if met, automatically give the product the end-of-waste status.

2.3.2.2. Testimonies from HOOP Lighthouses

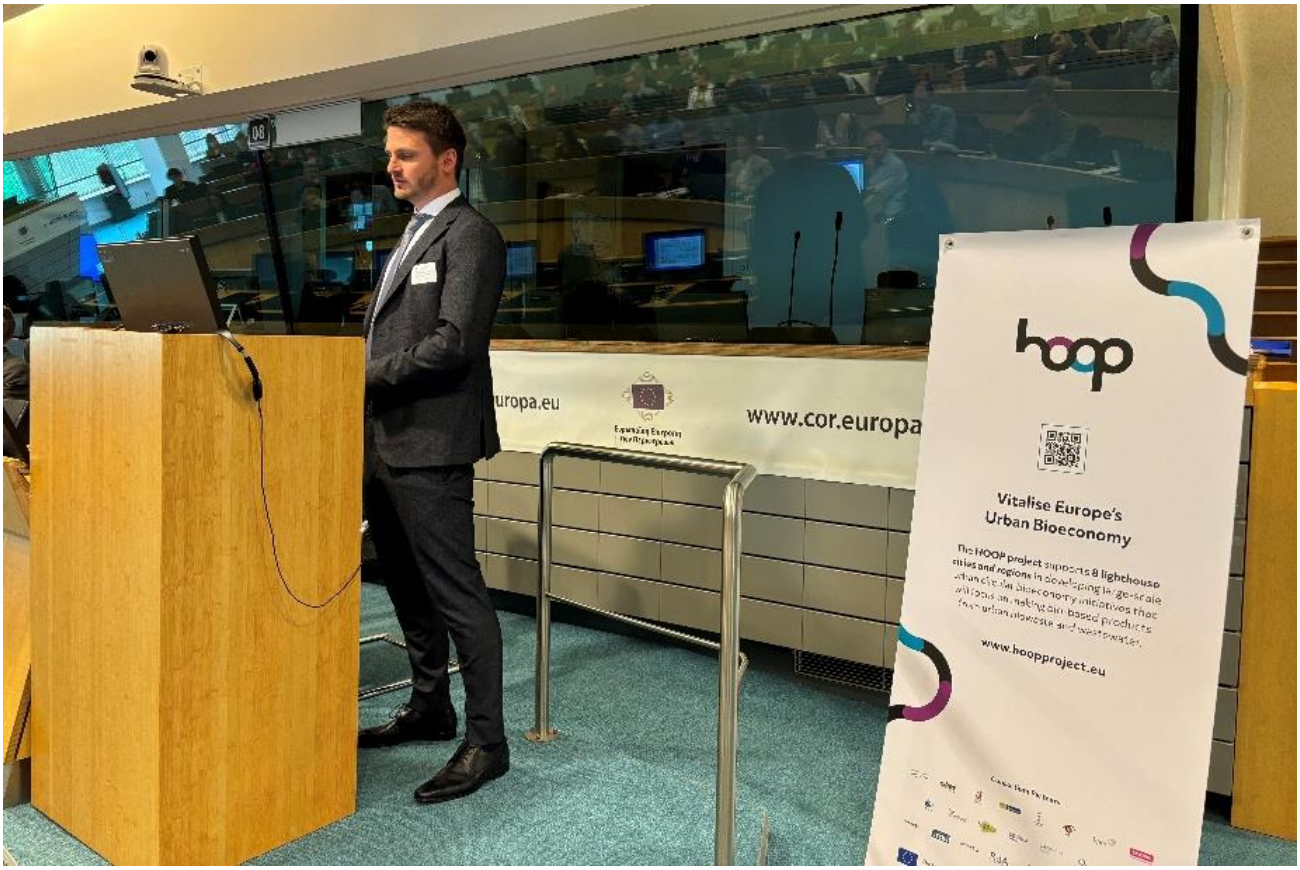

Figure 3. Testimonies from Lighthouses

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HOOP Lighthouse Porto (PT). Susana Lopes (LIPOR) introduced LIPOR's composting plant that treats the biowaste collected in the Greater Porto. The quality control of input material is regarded as pivotal to produce high-quality compost that is suitable for organic farming and sold at about 65€ per tonne. The challenge to comply with the ABP regulation was also highlighted, with the introduction of the new Fertilising Product Regulation (FPR) making it mandatory to comply with EU transformation standard for ABP (70°C for 1 hour with a maximum 12mm particle size) for the compost to be sold in other EU countries. LIPOR introduced a procedure with the support of the European Compost Network to propose an alternative hygenisation method with different parameters (particle size 200 mm, ≥ 55°C, ≥ 72 h / particle size 200 mm, ≥ 60°C, ≥ 48 h), that required a long process and documentations describing the process and an assessment of the risks associated. The application started in January 2023, and in April 2024 after a successful submission : a positive Scientific Opinion was published by the EFSA, which opens the possibility for the validation of the alternative method.

HOOP Lighthouse Münster (DE). Christoph Baumann (AWM) presented the experience of the Münster public waste management company on the possible introduction of pyrolysis to treat part of the digestate produced by their Anaerobic Digestion (AD) plant and lignin-rich sieving overflows from their composting unit (processing digestate). This process would lead to the production of biochar that can be used as soil conditioner and (renewable) energy. However, they face several barriers to implement the projects. First, pyrolysis is classified as incineration in Germany, meaning stricter emission limits and higher operating requirements, challenging the business model. Moreover, the use of biochar as fertiliser or soil conditioner is only possible with two options: the application of the German Fertiliser Ordinance that limits the feedstock to untreated wood, or the application of the EU FPR that would require a declaration of conformity with only one entity delivering this in Europe. Finally, the implementation of a pyrolysis plant would lead to unfavourable economic outcome: the processing of digestate with pyrolysis would mean the loss of the feed-in compensation for electricity that requires AD plants to compost the digestate, and the current exclusion of pyrolysis from EU Taxonomy limits the possibility of financing. Pyrolysis has a poor reputation in Germany due to the association with plastic pyrolysis, which also hinders the whole project.

HOOP Lighthouse Bergen (NO). Toralf Igesund (BIR) introduced the work carried out in Bergen on insects and single cell protein (SCP, already used to produce wine or cheese), that constitute a very resource-efficient way to produce proteins compared to meat and even fish. To feed insects, it is also possible to use organic waste, which makes it an interesting process to valorise it in a high-value product. BIR has been working with start-ups to develop such recycling routes, yet the lack of regulation makes it quite challenging. The ROOTS initiative already called for a revised regulation on insect farming, to allow more possible feedstock and stop considering them as "farmed animals". Besides, the current regulation on SCP lack clarity on the use of feedstock and is too restrictive when it comes to its application for food and feed. This lacking regulation is a challenge to finance these new technologies, especially their upscale from demonstration to full-scale industrial unit, since the investors see them as too risky. This comment can be extended to many upcycling routes for biowaste that are neither regulated nor illegal but perceived as too risky for investors.

2.3.2.3. Panel discussion: How to unlock the identified regulatory barriers and their economic consequences

The panel brought together three panellists: Riccardo Gambini, policy officer at the European Compost Network, and two people working in the Brussels Region (member of the HOOP Network): Nicolas Scherrier, project manager at Brussels Environment and in charge of the Brussels Region's biowaste roadmap, and Jean-Marie Savino, Director of Eco-Circulaire, and consultant supporting Brussels Environment with the implementation of

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bio-waste management and sorting obligation, especially with commercial bio-waste producers. It is interesting to note that Brussels Environment is not only responsible for the regional waste plan, but also to transpose and enforce the waste regulations as well as the APB regulation.

Brussels Environment reported that the European bio-waste sorting obligation contributed to the introduction of food waste separation in Brussels, and the Region translated it in a sorting obligation applied to all biowaste producers. While garden waste separation is well in place, only 11.5% of food waste is currently separately collected. The current strategy foresees that 30% of food waste will be processed in an upcoming AD plant while the rest should be treated on-site, in collective composting, or medium-scale units. However, the ABP regulation proved to be a challenge, especially for small-scale and decentralised composting. The Region managed to set rules to ease the requirements for these units (but they can only use the compost themselves, and not sell it) and invests many resources into training of compost communities to ensure that the rules are respected.

Jean-Marie Savino observed a strong fear of the ABP regulation by regulators (including Brussels). To him, the main explanation is that the ABPR is a very technical text that must be understood and interpreted by jurists. This lack of understanding generally leads to a strict application of the requirements, and whenever a new process aims to define an end-point criteria, the technical recommendations are not integrated, and the processes are aborted. Mr Savino believes that guidelines aiming to explain and simplify the ABP regulation for regional/national policy makers could help, yet they would need to be promoted by DG SANTE (considering that his experience is that technical recommendations from local experts are not taken into consideration). Besides, many regional stakeholders tend to consider that there are “good” and “bad” recycling routes for bio-waste, when it is much more nuanced. Another important barrier is that bio-waste separation generally comes with an additional cost, so few professional bio-waste producers do not comply with the sorting obligation.

Riccardo Gambini briefly introduced the European Compost Network (ECN) that brings together different types of organisations working on bio-waste recycling. He reminded the importance of introducing a recycling target for biowaste to reduce the share of bio-waste being landfilled and incinerated. Several other policy barriers were listed: the heavy administrative burden for plant operators to comply with the regulation, or the lack of consistency among the different policies surrounding biowaste management. ABP regulation is a common challenge for ECN members. When it comes to the Fertilising Product Regulation, Mr Gambini recognises that it was a significant part of ECN work since 2010, with the participation in many working groups that finally led to the introduction of non-mineral fertilisers, which constitutes a significant boost for “alternative (and waste-based) fertilisers”. Still, the compliance with the conformity assessment in the regulation is regarded as burdensome, costly, and complex, and there are not notified bodies performing this assessment. The ECN is pushing for the recognition of well-established quality assurance schemes in all Member States to perform the quality assessment. Finally, the ECN sometimes notices conflicts of interests between waste managers and local administrations, the latter being sometimes reluctant to impose bio-waste collection to the inhabitants.

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Figure 4. Panel discussion

2.3.3. TOWARDS POLICY DRIVERS: OVERVIEW OF ENABLERS, TESTIMONIES AND PANEL DISCUSSION

2.3.3.1. Circular Bioeconomy enablers for HOOP projects

Leandro Vaz (RdA) explained that one major objective of the HOOP project was to bridge the gap between circular bio-based projects and investors. He listed two types of policy instruments: the financial ones, including prioritisation instruments, incentivising instruments, and de-risking instruments, and the non-financial ones that include market-based instruments (e.g. tradable permits), non-market-based instruments (e.g. bans on single-use products), and the instruments that remove normative obstacles (e.g. harmonised end-of-waste status). Despite the availability of many different instruments, there are still many policy and regulatory risks, including the lack or inadequate policy frameworks, the longer implementation time of circular economy models making them more prone to permitting and tendering risks, the volatile, changing policy framework, and the lack of integration of externalities' costs. Finally, the HOOP tools and documents providing support on funding and financing were presented.

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2.3.3.2. Testimonies from local players

HOOP Lighthouse Almere (NL). Johan Splinter and Peter de Boer from Almere Municipality presented their rapidly growing city, which makes it more challenging to organise circular municipal waste management. One specificity of the Dutch context is the strict limit on contaminants set by the compost sector, which makes any contaminated biowaste sent to incineration instead of recycling. To overcome the problem of quality, different instruments were used: the change from 'duo-containers' (wheelie bins with two compartments for biowaste and residual waste) to mono-containers, and then the introduction of a kitchen bin for kitchen waste. Besides, several communication activities were performed: general campaigns to remove food waste from residual waste, direct communication when distributing the kitchen bins, and waste coaches engaging with citizens and distributing yellow and red cards leading to respectively a visit by the coaches and a visit by law enforcement agents. These different actions aim to lift resistance and prejudice against food waste sorting, make sorting more convenient, clear, and finally turn it into a habit, and seem to improve both capture rate and quality.

HOOP Network Member Alentejo (PT). Elsa Nunes from the consultancy IrRADIARE introduced the DECISO project and especially its work with the region, a very large, but also very low-density region in Portugal, working on circular agri-food business models. Within the DECISO project, the region aims to involve the private sector in circular economy schemes, and the project aims to bridge the gap among entrepreneurs, investors, and policy makers. Several activities have been implemented, such as the organisation of forum to bring together the different players, and the identification of current strengths and weaknesses. The next steps consist in improving the cooperation among organisations delivering authorisations and fundings, info days on financing schemes, and the identification of relevant companies to co-elaborate circular business models.

2.3.3.3. Panel discussion: how current and upcoming policies and funding schemes plan will further enable circular bioeconomy

This second panel discussions focusing on drivers for local circular bioeconomy schemes brought together four speakers: **Sara Bedin**, an independent expert on innovation procurement and HOOP project partner, **Robert Van Spingelen**, the president of the European Sustainable Phosphorus Platform, **Andrea Accorigi**, the coordinator of the Circular Cities and Regions Initiative coordination and support office, and **Jonas Byström** from the European Investment Bank (EIB) and the Circular City Centre.

Panellists first addressed Public Procurement of Innovation (PPI), a tool enabling tenderers to pull innovative solutions from the demand side, that most public players are unaware of. Ms Bedin explained that this is a powerful tool to foster the upscale of innovative solutions at low Technology readiness levels (TRL), but that many public authorities prefer market-ready solutions (highest TRL). There might be several instruments at EU level to overcome this challenge: reducing risks by communicating and financially supporting PPI.

Mr Accorigi and Mr. Byström mentioned some gaps in funding and financing, especially when it comes to the scaling up of projects: some financing schemes do not cover the necessary costs for preparing and executing the key steps of project upscale. Mr Byström mentioned that the EIB offers many different financial instruments and schemes where funding is complemented with loans. These blend financing options enable the synchronisation between financial resources at the start of the project. He also mentioned the opportunity for cooperative procurement and to define payback periods in a project-specific way. The EIB also published an online Circular City Funding Guide which allows to identify the right financing scheme. He also added the importance of approaching investors with **convincing projects, accompanied by thorough analysis** on risks

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and contingency actions, strengths and opportunities. Panellists also remarked that **technology de-risking** can be achieved by focusing efforts in up-scale one project rather than multiply up-scale demonstration units through unconnected projects. Another de-risking mechanism seldom adopted is royalty-based share.

Ms Bedin added that the many barriers to solution upscaling can be overcome by **adopting innovation public procurement schemes**. The mechanism reduces risks on both the demand and the offer side. The technology provider co-develops the upscaled solution aligning with the buyer (the public body)'s needs while fully keeping full, and the buyer ensures that the solution is tailored-made for their challenges and reliable. This mechanism pulls innovation from the demand side, rather than pushing it from the offer with the consequent seek for customers. In terms of regulatory framework, innovation procurement directive is unambiguous yet flexible.

When it comes to barriers to innovation, Mr Accorigi also mentioned that there is a gap between policy objective and the available funding at the different levels. It seems important to improve the leverage of Innovation projects such as HOOP and to facilitate the move from demonstrated technologies to full-scale solutions.

Mr Van Spingelen reflected on the fact that many HOOP Lighthouses have bet on the recovery of biowaste with the production of fertilisers, due to its technological readiness and a more favourable policy framework compared to other recycling routes. Indeed, the recent evolution of the regulatory framework of recycled nutrients has lifted several barriers, such as the question of the end-of-waste status. Currently, the biggest barrier is for category 1 ashes and byproducts, in which much phosphorous is lost and that cannot be used as fertilisers.

When it comes to local policy making for circular bioeconomy deployment, Municipalities and Regional mainly through two channels: i) fostering the selective collection of high-quality biowaste streams and ii) create the industrial symbiosis and innovation environment apt for their valorization. However, the panelists invite them to explore more options like complex financing schemes and public procurement of innovation, to actively accompany the local stakeholder in the capital-raising phase of the project upscale and ready-for-market implementation. **Drivers to upscale urban circular bioeconomy projects are available but not yet widely known**.

2.3.4. FINAL THOUGHTS FROM THE EUROPEAN BIOECONOMY BUREAU

David Newman concluded the policy conference, reflecting on the current plastic crisis and the fact that, in spite of the 32 years anniversary of the Rio Summit, little progress has been made. Many projects and financing schemes failed to make a significant impact. He considers that, when it comes to circular economy uptake, there are two "elephants in the room":

1. incineration, which represents a significant source of incomes for waste management companies and a convenient solution for public authorities;

2. on-going incentives for fossil-based industries and fossil fuel, which prevents circular biobased systems from being competitive.

He also remarks to the audience that currently the bioeconomy focuses too much on (renewable) energy that is mostly about wood burning, and that gets massive incentives compared to bio-based products. There is also a need for market pull mechanisms.

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Mr Newman called for the introduction of bioplastics on the market through the policy framework, and keep in mind that actually very few plastic waste fractions are recyclable (and recycled). He also called for the introduction of biowaste-related targets in the Framework Directive (e.g. on quantities of biowaste in residual waste), considering that the current sorting obligation has seemingly not led to a significant increase of food waste collection.

2.3.5. QUESTIONS AND COMMENTS FROM THE AUDIENCE

1. *On bioplastics recycling, how composting would be better than recycling into new plastic items?* Mr Newman indicated that compostable bags were a good instrument for biowaste collection, leaving no microplastic in the compost, and bringing C-rich feed to compost microbiome, enhancing the process. Besides, he reminded the audience that recycling of conventional plastic is currently very limited to an average of 5% of the total quantity of produced and used plastic items.

2. *Why isn't there any target on biowaste recycling in the Waste Framework Directive?* Despite the fact that it was requested by several players, the European Commission refused to introduce it.

3. Finally, a representative of the municipality of Bodø (Norway), HOOP member, mentioned the logistical challenge with biowaste collection due to the long distances of transport needed (remote areas, weather conditions, etc.). However, Mr Newman could not provide an insight for such a logistical problem.

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3. Cities Conference

THE CONFERENCE IN A NUTSHELL	**Focus**	**What barriers and drivers for the transition to local circular bioeconomy systems?**
	Date	Wednesday 5 Jun 2024 (Day 2)
	Duration	9 hours
	Place	European Committee of the Regions, Rue Belliard 99/101, Brussels (Rooms JDE 51 and JDE 53 – 5th floor)
	Nº Participants	92

3.1. General presentation

The HOOP City conference aimed to bring together HOOP Lighthouses and HOOP Network Members to discuss the more practical aspects of circular bioeconomy and biowaste recycling. It consisted of morning **plenary session**, where HOOP Lighthouses could pitch their main findings, and some HOOP Members could present their current actions and challenges, plus the afternoon **parallel workshops** sessions where HOOP Lighthouses, experts, and Network Members had more opportunities to reflect on key topics such as financing or stakeholder engagement. In the afternoon, the **"expo corner"** gave the participants the opportunity to discover the different HOOP tools by the hands of HOOP partners. The final agenda slot was then employed to gather valuable feedbacks to design **exploitation** strategies for the HOOP Hub and the HOOP Network.

3.2. Agenda

Time	Activity	Speaker
8:30 – 9:00	Welcoming participants	
9:00 – 9:15	**Opening words** | The role of local and regional players for circular bioeconomy	Markku Markkula (former President of Committee of the Regions and current President of Helsinki Region)
9:15 – 9:30	**HOOP project** | 4 years of PDA and bringing together European cities and regions around local	Gemma Castejón (CETENMA)

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	circular Bioeconomy. Introducing the HOOP Network.	Serena Lisai (ACR+)
	Inspiration slot 1 | Guided by Lighthouses' Shine	
9:35 – 10:15	Round 1 - Discussion with HOOP Lighthouses to discover the lessons learned from their HOOP journey and the future perspectives. *Moderated by Anna-Carina Diedrich (CSCP)*	
	Münster (Germany)	Christoph Baumann (AWM)
	Murcia (Spain)	Mercedes Bernabé (Murcia municipality)
	Western Macedonia (Greece)	Katerina Tsepoura (CluBE)
	Bergan (Norway)	Toralf Igesund (BIR)
10:15 – 11:00	Round 2 - Discussion with HOOP Lighthouses to discover the lessons learned from their HOOP journey and the future perspectives. *Moderated by Anna-Carina Diedrich (CSCP)*	
	Greater Porto (Portugal)	Susana Lopes (LIPOR)
	Albano Laziale (Italy)	Andrea Vignoli (ANCI Lazio)
	Kuopio (Finland)	Ulla Santi (Savonia)
	Almere (The Netherlands)	Peter de Boer (Almere municipality)
11:00 – 11:30	Coffee break	
	Inspiration slot 2 | The circular bio-based journey of the HOOP Network	
11:30 – 12:30	Discussion with members of the HOOP Network of cities and regions on their local initiatives and the HOOP support. *Moderated by Serena Lisai (ACR+)*	
	Brussels Region (Belgium)	Nicolas Scherrier
	City of Krakow (Poland)	Michał Gelata
	Maia Ambiente (Portugal)	Mónica Ferreira

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	Federation of Intercommunity Development Associations (Romania)	Liliana Nichita
12:30 – 13:00	**Conclusions** | Take-aways messages and explanations for the afternoon break-out sessions	Serena Lisai (ACR+)
13:00 – 14:00	Lunch break	
	Parallel session 1 | Dreaming a new bioeconomy	
14:00 – 14:50	Technologies available at industrial scale for biowaste. How to select them? What are the benefits? *Room JDE 53*	Miguel Ángel Suárez and Elisa Gambuzzi (CETENMA) Lighthouses: Münster
	Funding and financing option and business models for circular bio-based value chains. *Room JDE 51*	Leandro Vaz (RdA) and Kees Joosten (Bax&Co) Lighthouses: Kuopio, Bergen and Almere
	HOOP must-know tools *Expo corner in the agora*	
	Parallel session 2 | Together for circularity	
15:00 – 15:50	Drivers and solutions for stakeholder engagements. *Room JDE 53*	Anna-Carina DieDrich (CSCP) All Lighthouses
	Public Procurement of Innovation and Open Market Consultation *Room JDE 51*	Sara Bedin (Smart Procurement) Lighthouses: Porto
	HOOP must-know tools *Expo corner in the agora*	
16:00 – 16:30	Co-creating the future of the HOOP Network, HOOP project development assistance and closing words.	Lucie Blondel (CCRI) Jean-Benoît Bel (ACR+) Gemma Castejón (CETENMA, HOOP Coordinator)
16:30 – 17:30	Networking drink	

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3.3. Main outcomes from sessions

3.3.1. OPENING: THE ROLE OF LOCAL AND REGIONAL PLAYERS FOR CIRCULAR BIOECONOMY

Figure 5. Introduction by Markku Markkula

Markku Markkula (President of Helsinki Region) opened the day and set the scene for the exchanges by recalling the utmost importance of bioeconomy for the Green Transition, by pointing the importance of energy and especially electricity, but also for new sustainable materials for construction to allow the needed wave of renovation. He also insisted on the important link with the EU climate policy and competitiveness, two important elements for the current and future EU policy. He also listed the five key actions that the Committee of Regions promotes for circular economy: 1) consolidate the EU taxonomy, 2) build capacity through informal and formal education across all society, 3) make national and international policies more consistent, 4) develop more financial instruments to foster the circular bioeconomy and 5) increase the collaboration among the different projects and initiatives to avoid “stand-alone” activities.

3.3.2. RESUME OF 4 YEARS OF THE **HOOP PROJECT: IMPACTS AND THE HOOP NETWORK**

Gemma Castejón (CETENMA) summarised the four years of the project by presenting the Project Development Assistance provided to the 8 HOOP Lighthouses and the tools and materials that the Consortium developed

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and collected to help other cities and regions across Europe to foster circular bioeconomy. Everything is compiled in a knowledge platform on circular bioeconomy, the HOOP Hub.

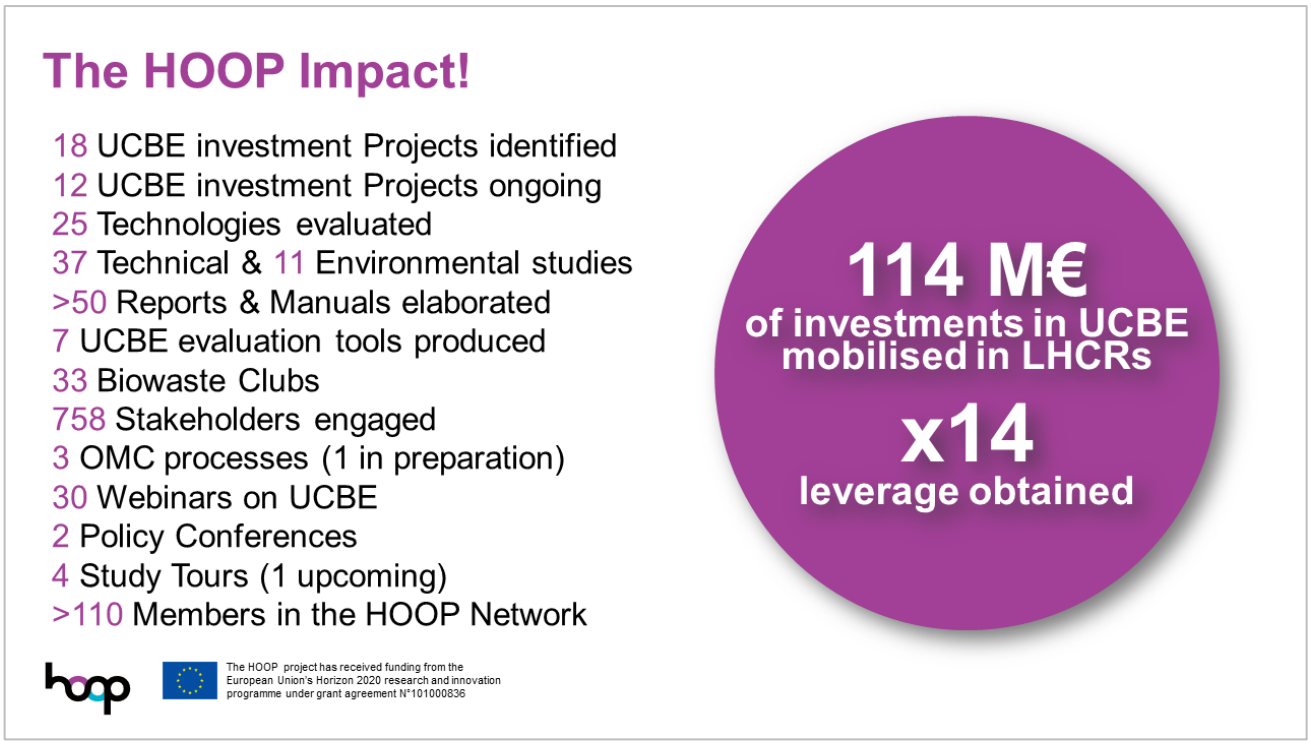

Figure 6. Slide presented to the audience, resuming the HOOP impact

Serena Lisai (ACR+) reflected on the HOOP Network, that already brings together 119 cities and regions across Europe as of June 2024 and still growing, and the different activities organised to foster replication: study visits, interactive workshops, support provision; also reminding the audience about the importance of inter-personal communication to promote the exchange of good practices.

3.3.3. INSPIRATION FROM THE HOOP LIGHTHOUSES

Figure 7. Inspiration slot by Lighthouses

The core morning session of the City Conference was separated in two sessions where each HOOP Lighthouse shortly presented their journeys through the improvement or implementation of new solution for biowaste collection and valorization. Resumes are presented below.

HOOP Lighthouse Münster (DE). Christoph Baumann (AWM) presented the technologies explored by AWM: pyrolysis and enzymatic digestion, for which they are currently identifying suitable feedstock and potential valorisation routes for the end-products (biochar and hydrolysate).

HOOP Lighthouse Murcia (ES). Mercedes Bernabé (Murcia municipality) presented the technologies at stake in Murcia: Volatile fatty acids from sewage sludge and soil additives from organic waste, but also the experience gained on public procurement of innovation and open consultation, and the opportunity to analyse the perception of citizens on bioproducts.

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HOOP Lighthouse Western Macedonia (GR). Theodoros Gkiourkas (CluBE) presented the work achieved in Western Macedonia, focusing on the fermentation of used cooking oils and production of functional ingredients from spent coffee grounds. Even though they faced many challenges linked with the identification of end-users and associated technologies, the design of collection schemes for the two fractions at stake, and the difficulty to involve the HoReCa sector (key waste producers), CluBE managed to start the collection of spent coffee grounds and to set valorisation plants at pilot scale. However, the identification of funding remains a challenge.

HOOP Lighthouse Bergen (NO). Toralf Igesund (BIR) presented their work on different projects, focusing on insect fed with organic waste, microalgae cultivation from biowaste, and food waste recovery to make feed. They identified relevant start-ups to develop the projects but could not find any investors so far. Insect productions is being implemented at larger scale on the Voss Biopark. BIR is also trying to push for policy evolution enabling the use of municipal bio-waste for food and feed.

HOOP Lighthouse Greater Porto Region (PT). Susana Lopes (LIPOR) highlighted the overall objective of LIPOR within HOOP: the valorisation of all by-products from their composting plant and future AD plant, through the production of biochar from refuse materials of the composting plants and uncompostable feedstock (e.g. invasive or diseased plants) or the nutrient extraction from liquid digestate. LIPOR is currently looking for funding and financing possibilities and identifying possible legal issues linked with both recycling processes. They also plan to pursue their work on stakeholder and citizen engagement, keeping the HOOP “biowaste club” approach.

HOOP Lighthouse Albano Laziale (IT). Elisa Gambuzzi (CETENMA) replaced the speaker from ANCI Lazio who could not attend the conference to present the UCBE advancements in Albano Laziale. She mentioned the work done to improve the already impressive quality and quantity of separately collected biowaste, especially through the introduction of a Pay-as-you-throw scheme in 2019, that contributed to reaching an 80% collection rate. As part of the HOOP PDA journey, Albano Laziale clustered with other nearby municipalities to improve the separate collection of used cooking oils with the ambition to create a new value chain to produce a biodegradable biopolymer to be used as functional ingredient in the flourishing regional cosmetics sector.

HOOP Lighthouse Kuopio (FI). Ulla Santi (Savonia) presented the experience of Kuopio, focusing on the stakeholder engagement process that eventually led to the implementation of a pilot-scale biochar reactor with a capacity of about 90 kg/hr. They also highlighted their business model for the HOOP Urban Circular Bioeconomy Hub to make it a one-stop solution for cities and regions wishing to improve their circular bio-based strategies.

HOOP Lighthouse Almere (NL). Peter de Boer (Municipality of Almere) introduced the technologies implemented within HOOP, including the conversion of invasive species into construction materials to make cycling path. He also mentioned the fragility of such circular bio-based business model, linked with the unsteady inflow of biowaste.

In the discussion timeframe, speakers agreed on several common points:

1. the fact that Biowaste Clubs, the stakeholders engagement dynamics organised by each Lighthouse during the HOOP project, were essential to shape new recycling routes for biowaste, and

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2. the sheer importance of quality biowaste to achieve such innovative recycling. Separate collection is a key step that requires constant communication, engagement, supervision and economic instruments such as pay-as-you-throw systems.

Participants had the opportunity to engage in a conversation with the panellists. One participant recalled the importance of **waste prevention** and the need to consider it before considering the production of new materials. Another participant asked why **textiles** were not considered in HOOP. It was replied that the composition of textiles and its diversity/complexity make it challenging to sort full natural fibres. Besides, textiles waste requires other specific recycling routes that are still under development.

3.3.4. INSPIRATION FROM HOOP MEMBERS

Figure 8. Inspiration slot by HOOP members

The second session consisted in a discussion with members of the HOOP Network of cities and regions on their local initiatives and the HOOP support. The panel discussion brought together very diverse organisations: The Brussels Region (Belgium), the City of Krakow (Poland), Maia Ambiente (Portugal), and the Federation of Intercommunity Development Associations (Romania).

HOOP Member Brussels (BE). Nicolas Scherrier (Brussels Environment) presented the biowaste situation in the Brussels Region, including its regulation and sorting obligation, and the need to promote sorting to citizens and professional biowaste producers. For the later, there are still many illegal practices and non-compliance with sorting obligations, and the impossibility to control them effectively. An interesting point of Brussels strategy is the importance given to decentralised approaches despite the very urban context.

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HOOP Member Krakow. Michał Gelata (Municipality of Krakow) presented the latest progress made on food waste sorting, with the introduction of a door-to-door collection system also including the catering sectors, supported by the use of barrels. The system is well accepted by users and combined with a home-composting system linked with a tax reduction.

HOOP Member Maia (PT). Mónica Ferreira (Maia Ambiente) showcased the latest development on municipal waste collection in the municipality of Maia in the Greater Porto area. A PAYT system was progressively introduced in 3 phases, targeting different typologies of housings. The municipality has set ambitious targets associated with a comprehensive action plan mixing food waste prevention, decentralised composting, and provisions on collection such as collection points for inhabitants that don't have access to a door-to-door solution.

HOOP Member Romanian Association of Municipalities FADI. Liliana Nichita (FADI) presented the status of biowaste management in Romania, with different approaches: door-to-door systems for single houses, collective bins for high-rise buildings, and decentralised (home) composting in rural areas. The country faces different challenges: the lack of treatment capacity for half of the population, which slows down the introduction of separate collection, the lack of market for compost and the lack of quality standards. Collection in bring points also tends to give poor quality, leading to biowaste being sent to landfills or mechanical-biological treatment.

Panellists also reflected on how HOOP supported their own strategies and activities. They found the HOOP approach relevant, such as the Biowaste Clubs, as well as inspiration from the tools and resources centralised in the HOOP Hub, but also and mostly from the different interpersonal exchanges during workshops and study visits.

A representative of DG ENV of the European Commission also encouraged participants to keep on the HOOP dynamics, for instance by mobilising the TAIEX programme, and expressed interest in supporting future actions.

3.3.5. PARALLEL WORKSHOPS

The afternoon sessions consisted in more interactive parallel sessions, each one targeting a specific challenge with the input of both HOOP experts and HOOP Lighthouses.

3.3.5.1. The expo corner

One of the workshops was set as an *expo corner*, where HOOP partners explained participants where to find evaluation and assessment tools and educational material and how to use it depending on the challenges they aim to face.

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Figure 9. Presentation of HOOP tools

3.3.5.2. Technologies available at industrial scale for biowaste

How to select them? What are the benefits? Moderated by Miguel Ángel Suárez and Elisa Gambuzzi (CETENMA), with the participation of HOOP Lighthouse Münster.

The session was introduced by CETENMA, presenting the main points to consider when investigating technologies, such as the biowaste streams to be valorised, the available technologies, existing cases, but also alignment with local and regional strategies and economies. When trying to identify the best available technologies for a territory, the question of maturity of the process (TRL), the legal framework of the process and the product, the existence of a market for the final product, but also the impact on local circularity should be considered.

There were several questions and discussions between HOOP Members and experts. Some questions were asked about the selection of technology for anaerobic digestion (e.g. wet vs. dry anaerobic digestion process), and about the difficulty to plan for the application of digestate when there are uncertainties on the quality that could be obtained. CETENMA explained that the process will depend on the nature of the feedstock, especially the humidity content. Some waste treatment companies changed their anaerobic digestion process with the evolution of the available feedstock, like AMW that shifted from a wet to a dry process. This choice is important to consider and might require some adaptations: AMW reported that they had to use unmatured compost to keep the input material below the humidity level.

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CETENMA also mentioned that innovative recycling routes are not necessarily in competition with more traditional ones such as composting and anaerobic digestion. They can be applied to side streams and by-products of these processes or to other biowaste fractions not recyclable by them.

The topic of quality was also addressed. Experts agreed on the importance of quality of the input material (so of the collected waste) to guarantee the quality of final product but also to prevent losses during pretreatment. It was also mentioned that macro pollutant could be removed but not micro pollutants. The upcoming quality standards for input material entering biowaste treatment units developed by the Life BIOBEST project was also mentioned, to improve the quality of final products.

3.3.5.3. Funding and financing options and business models for circular bio-based value chains

Moderated by Leandro Vaz (RdA) and Kees Joosten (Bax&Co), with the participation of HOOP Lighthouses Kuopio, Bergen and Almere.

The session started with the presentation of three Lighthouses: Bergen, Kuopio, and Almere, presenting the value-chains at stake but also challenges with the business models and investments.

Discussions addressed the issue of going from pilot to full-scale. Speakers acknowledge the fact that the most difficult part for funding innovation lays in scaling-up. The private sector is often reluctant to fund new technologies developed by researchers due to the perceived financial risks. Public funds are hesitant to subsidise, because of potential state aid issues. However, risks mostly come from regulation rather than technological uncertainty. Public authorities must play a more prominent role in taking away - unnecessary - barriers in regulations, which were drafted decades ago, in the era of linear economy.

Another important point is circular buying / circular procurement, that should become the trend for governments. This means training civil servants in charge of procurement who should be updated on new available technologies and solutions. Public authorities, like municipalities, can take the lead in applying innovations and in this way boosting start-ups, scale-ups, SME's and other solution providers. This will also give a positive signal to private buyers and investors.

3.3.5.4. Drivers and solutions for stakeholder engagements

Moderated by Felix Schumacher (CSCP), and with the participation of all HOOP Lighthouses.

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Figure 10. Parallel workshop on stakeholders engagement

CSCP and Science for Change presented some highlights from the HOOP project, especially the concept of Biowaste Clubs that are regarded as a key to success for the introduction of innovative recycling routes. The session was very interactive and relied on the perspective of the different HOOP Lighthouses, especially Almere, Kuopio, and Münster. The initiator of such dynamics were cities and regions in HOOP, but with different status. In some cases, other organisations could take the lead with a mandate from the public authority. One important point is that there is not a single way to set such a process: it depends on the topic, the target audience, etc. It was advised to have a good understanding of the challenges at stake to identify participants and convey the idea that this challenge is also their challenge and make the topic their own. A key aspect is also to build trust with participants and to really consider their perspectives. Participants should be presented with clear explanation of the topic, the process, the project, and understand how it concerns them. It was also mentioned that a proper selection is necessary: while there should be a good diversity of relevant stakeholders, there should not be too many participants, otherwise no consensus can be reached.

Some Lighthouse highlighted some opportunities arising from their Biowaste Clubs: in Münster, interesting discussions on pyrolysis allowed to address key aspects such as the connection to the energy grid and the question of subsidies. The focus put on biowaste quality led to more work on inspection and AI-powered

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cameras spotting contamination directly in collection trucks. Other mentioned challenges: the difficulty of the technical staff to develop a stakeholder engagement process where motivating participants is essential. Another Lighthouse mentioned the difficulty to secure the same level of commitment from all participants, and the fact that the lack of commitment of key players (such as national authorities) can discourage other participants.

CSCP indicated that context is an important parameter to consider when organising stakeholder engagement. The type of audience (e.g. young people, environmentally aware citizens, etc.) might ease or complicate the involvement. Understanding their constraints that could prevent them from joining consultations or events should be considered. As an illustration, CluBE in Western Macedonia decided to organise an event with games for children over the weekends as a way to attract parents to engage in discussion and feedback-gathering processes.

Science for Change presented their citizen science approach to collect information and insight from citizen on biowaste and bio-based end products. The results of these feedback-gathering mechanisms are not the most essential part, it is mostly about better understanding their own perspective and also make them reflect own their behaviours. Using a more playful approach makes the process more reassuring. In Münster, the process helped to identify the issue of bioplastics in sorting instructions which led to a specific communication activity on this topic.

3.3.5.5. Public Procurement of Innovation and Open Market Consultation

Moderated by Sara Bedin (Smart Procurement), with participation of HOOP Lighthouse Porto, the session started with key recommendations from Sara Bedin:

- Placing performance conditions on the public procurement contracts ensures better performance and keeps the market more competitive
- Participation in public procurement should not be too complex – SMEs do not have the same manpower to navigate complex procedures and they play a key role in promoting innovation- they should not be left out
- Coordinating the procurement with different partners from the public sector would allow them to share risks

LIPOR, that engaged in a public procurement of innovation within the HOOP project, also shared their experience on the selection of a technology to recycle the newly collected food waste, with a focus on processes not generating new waste. An open market consultation was launched, involving their colleagues from the legal department to ensure transparency and purchasing and marketing department to assess the market performance of bio-products. The consultation consisted in an online survey for technology provider, also in English, to identify different solutions, and a hybrid event for companies so that solution-providers can promote their technologies. It proved to be an interesting process to review existing companies without making any commitment yet and paved the way to a better selection of the best technology.

The session was concluded by an interview of Lieve Bos, from DG R&I. She mentioned that there is an increasing interest in investment in innovative technologies in different Member States, leading to more incentives for innovative procurement. Some MSs introduced structural funds acting as a driver for the selection

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of innovative solutions. Innovative procurement is strongly driven by environmental policies, and public procurement is seen as a strong driver for R&D in circular solutions, considering that private markets have little incentives in marketing sustainable but unprofitable solutions. Furthermore, innovation is important for strategic autonomy and resilience in the supply chain. For instance, giving funding to multiple suppliers in parallel creates multiple suppliers for solutions that are located in Europe. It is also signalling to private sector about what the EU wants to see developed.

3.3.6. CO-CREATING THE FUTURE OF THE HOOP NETWORK AND FINAL WORDS

3.3.6.1. Feedback-gathering session on the exploitation of the HOOP Hub and Network

This final session started with online questionnaires aiming to discuss the continuation of the HOOP Network, coordinated by ACR+. Various questions were asked to participants (focusing on HOOP Members and Lighthouses) to understand their experience with the HOOP Network and the HOOP Hub, and how they see follow-up activities.

When asked about the preferred HOOP services, the following replies were obtained:

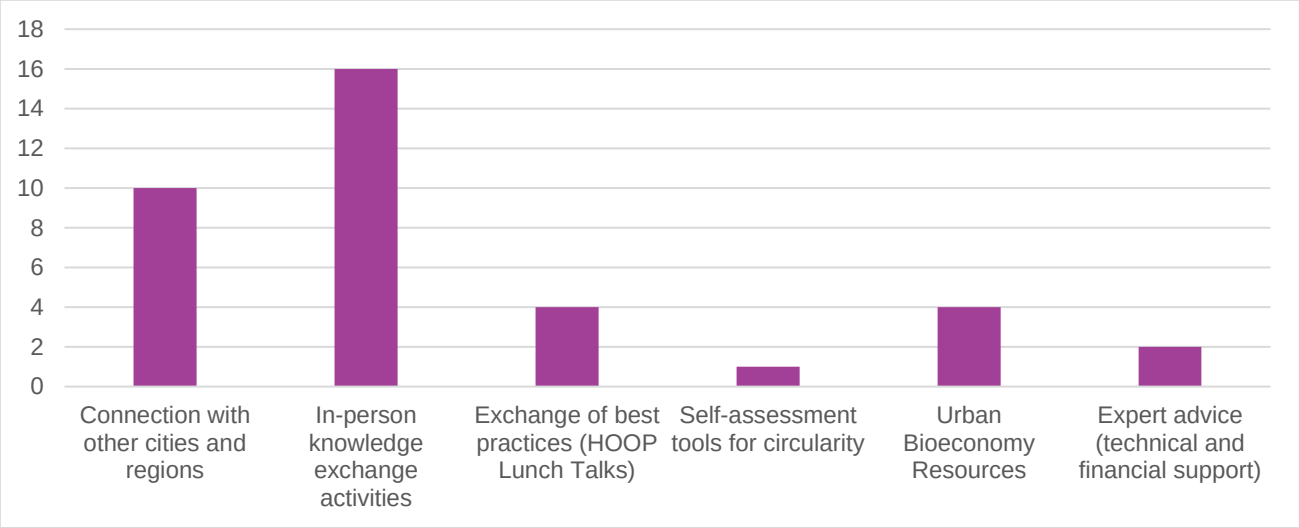

Figure 11. Which are the most useful services of the HOOP Network?

It is very interesting to note that most participants valued more the interaction with other cities and regions over the other services. In-person exchanges were especially promoted.

When it comes to the usefulness of HOOP services for the cities and regions, the following elements were reported:

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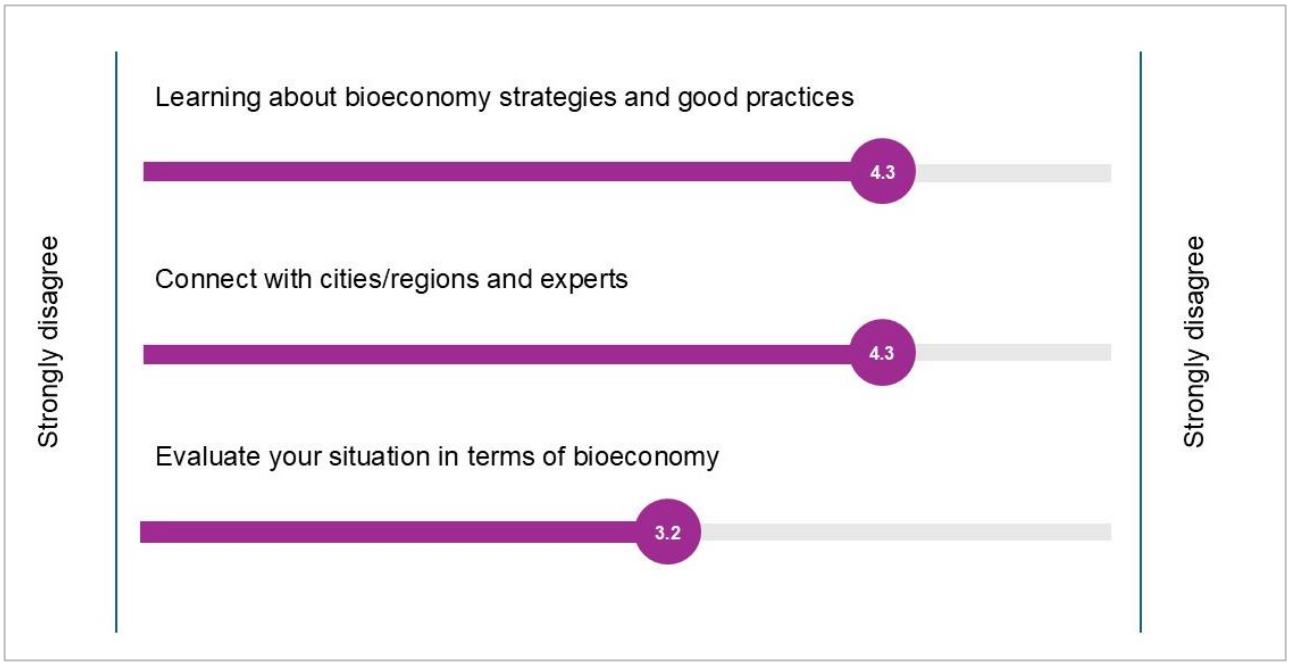

Figure 12. To which extend did the HOOP Network help you

Again, the participants indicated that the HOOP Network was effective to connect them with other cities and regions, and to bring them good practices. The evaluation of their own situation was less favourably assessed, which can be led to the fact that few cities managed to use the HOOP Circularity Label.

Several questions were asked regarding the HOOP Urban Circular Bioeconomy Hub:

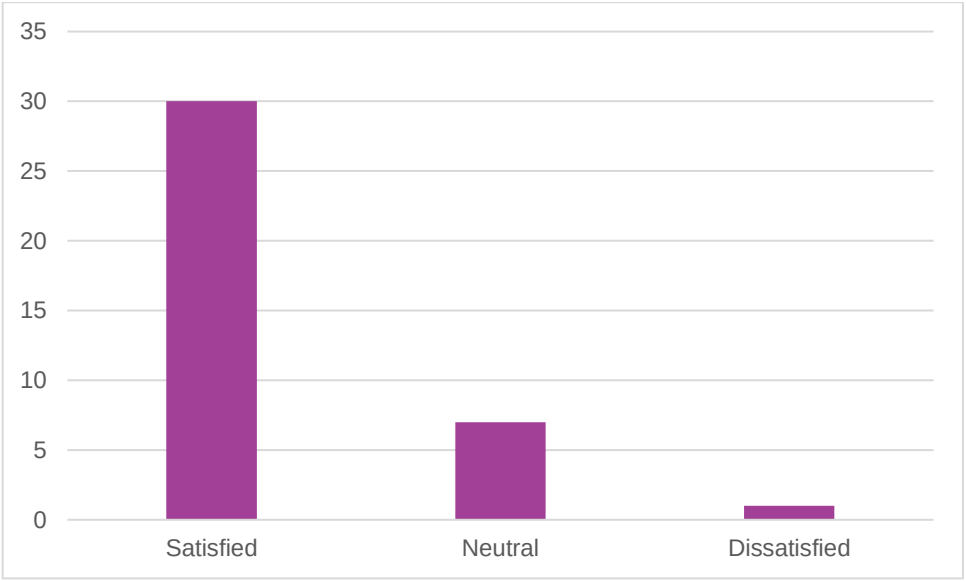

Figure 13. To which extend are you satisfied with the HOOP Urban Circular Bioeconomy Hub?

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Most participants seemed to be satisfied with the Hub. Some reported to be neutral, possibly due to the fact that some HOOP Members were not necessarily familiar with its content.

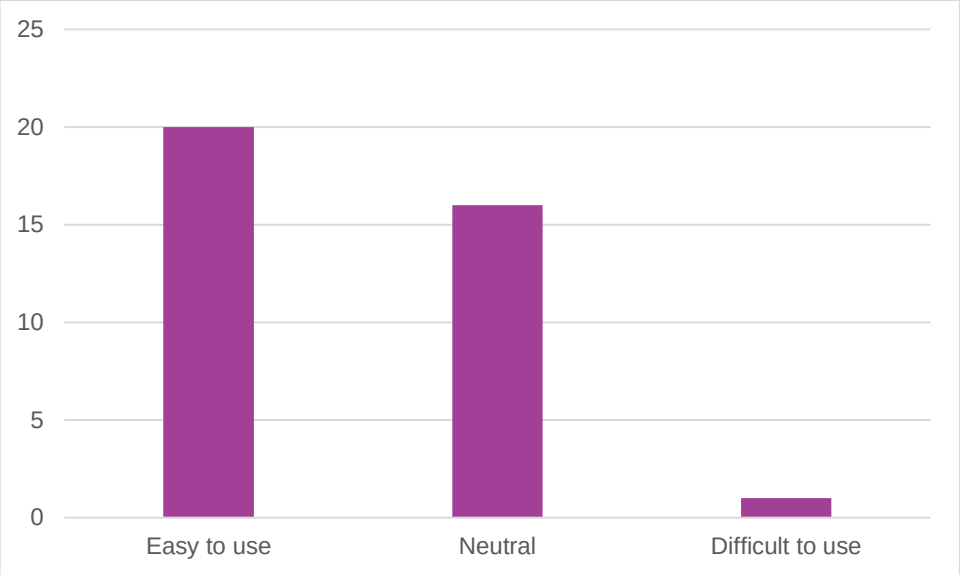

Figure 14. How easy to use do you find the platform?

Responses on the user-friendliness of the Hub were more mixed, with over 40% of respondents being neutral regarding it. It might be relevant to keep explaining how the Hub is organised during upcoming communications with the HOOP Members.

Participants could express their wishes and share feedback on the Hub, the following input was received:

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Figure 15. Which features should be included in the Hub to support your local bioeconomy activities?

Interestingly, some requested features are already present in the Hub: propositions of study tours, connection to other players, or manuals, that are published on the Virtual Library. Many participants mentioned the inclusion of universities and academics in the HUB. While most section of the HUB is accessible to all organisations, the more specific services (such as invitation to events, tailored support) are reserved to cities and regions since they are part of a replication strategy and aim to lead to more practical actions and policies.

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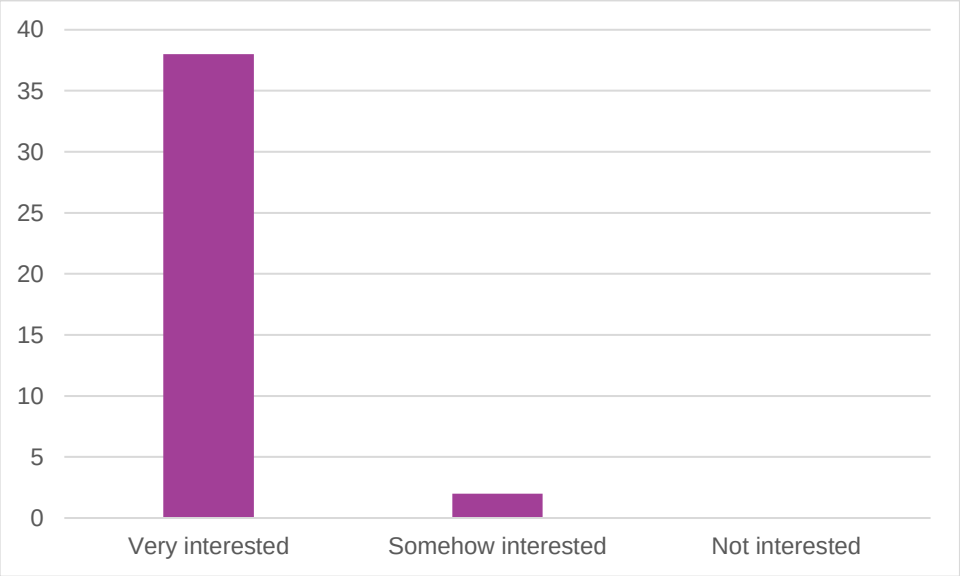

Figure 16. Are you interested in the continuation of the HOOP Network?

Most participants were very interested in the continuation to the HOOP Network. This makes it relevant for the HOOP partners to identify relevant exploitation scenarios and follow-up activities. These scenarios were proposed to the participants, who provided an assessment of their interest:

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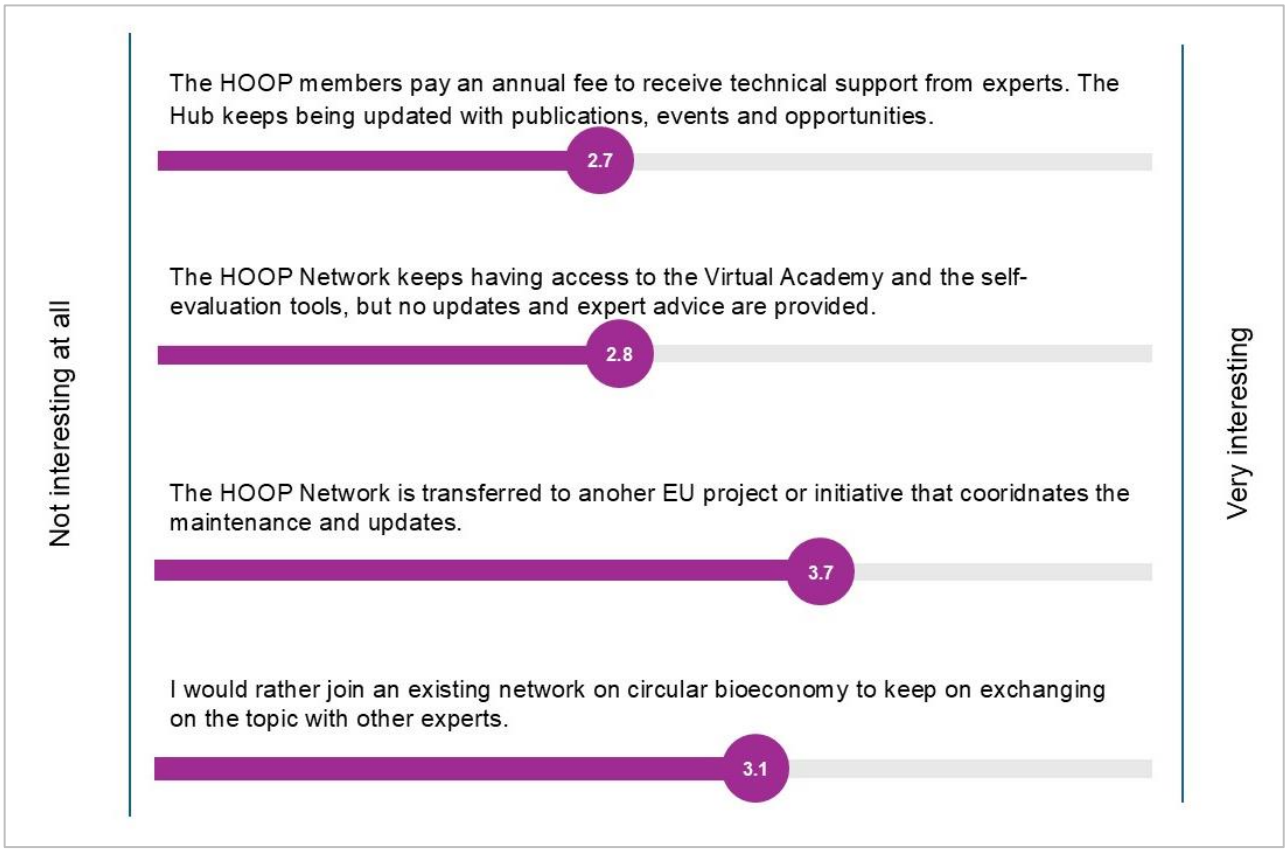

Figure 17. If you imagine a HOOP Network 2.0, how will you evaluate these scenarios?

Most options received mixed responses. The preferred option seems to be the transfer of the Network to another initiative or project, followed by the opportunity to join another existing network. These possibilities will be further explored by the HOOP Exploitation team.

As for the possible continuation of the HOOP City conference, the following feedback was received:

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Figure 18. What about an annual conference for cities and regions on circular bioeconomy?

All participants were all interested in organising another session, preferably for free. This implies that the continuation of the HOOP Cities Conference should be supported by grants/funds schemes. Some also volunteered to host or support a next edition. ACR+ plans to follow up on this in contact with the HOOP Network.

Finally, HOOP Members and Lighthouses were asked to make more general suggestions for the continuation of the HOOP Network:

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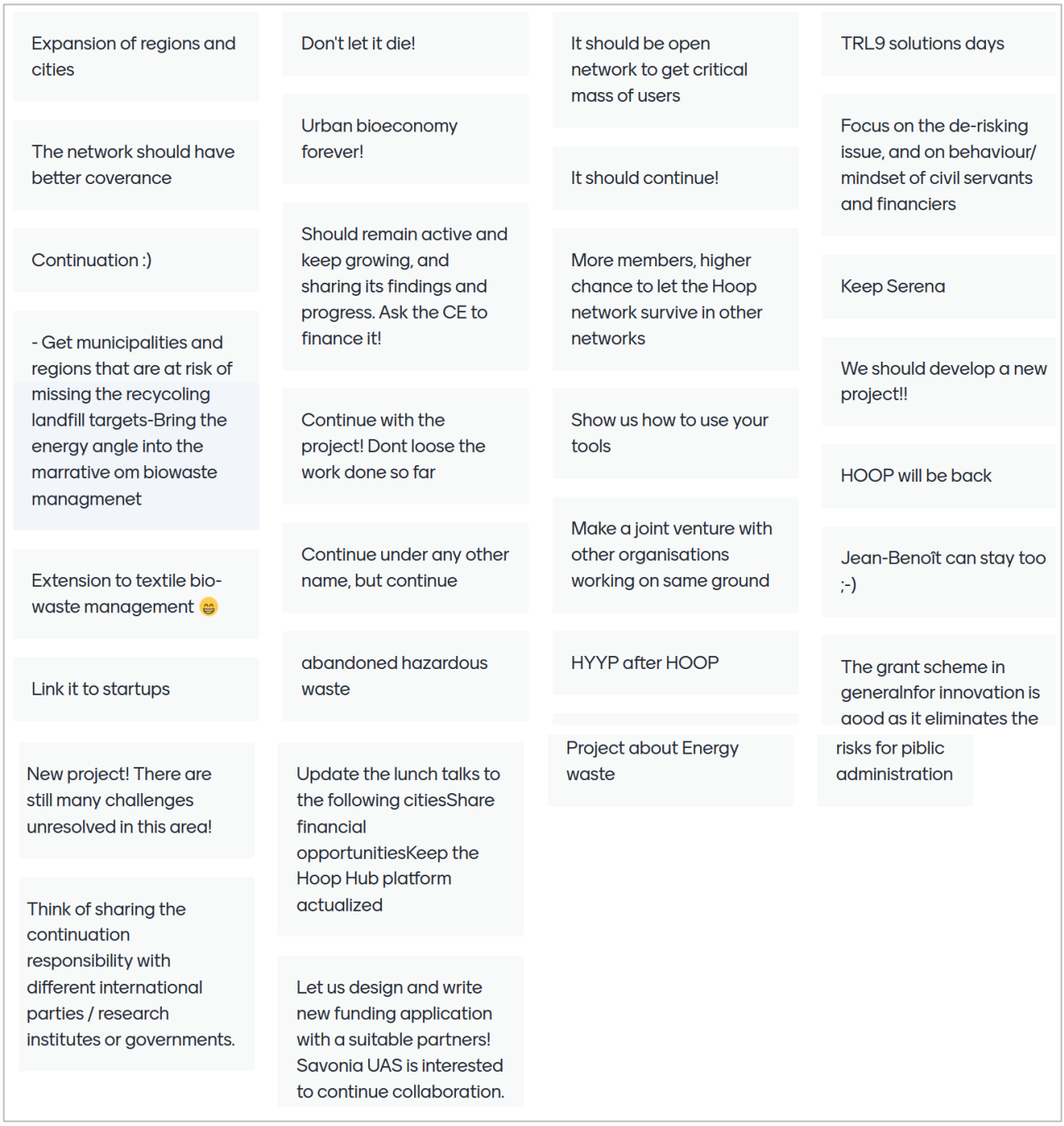

Figure 19. Any other thoughts on the future of the HOOP Network?

Among the suggestions, several key ideas can be identified:

- The interest for a continuation of the HOOP Network, possibly via a new project or collaboration with other organisations.

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- The opportunity to expand the Network to more territories.
- The opportunity to expand to new topics such as energy, textiles, hazardous waste, etc.

Overall, the session showed that there is a clear interest of the HOOP Members for the HOOP Network, the HOOP Hub and its services, with a focus on connections among members and in-person meetings and interactions. It also shows that many Members were unaware of the different services provided by the Network, someone that was also identified during a survey organised halfway through the project, and despite the inclusion of specific emails and presentation of each key service during the monthly HOOP Lunch Talks. In-person meetings such as the HOOP City conference seems to be a great way to make the Members more aware of the different services, and the organisation of such large events halfway through a project, when services are in place, could be a good way to improve the involvement of such "follower territories" and thus the impact of the technical assistance options.

The valuable feedback gathered in this session will be taken into account when designing and evaluating business concepts and business models for the HOOP Hub and the HOOP Network, for their sustainability beyond the project life. The implementation strategies and available solution for the HOOP tools continuation will be presented at the HOOP Final Event.

3.3.6.2. Closing words

Lucie Blondel (DG RTD) reminded that there will be an open stakeholder consultation to consolidate the topics for innovation, research and development project proposals to be launched in 2025. Stakeholders from the private sector are engaged in the dialogue. The work done by HOOP and similar projects are being taken into account by the EC to create policy recommendations and financial frameworks.

Communities such as HOOP need to continue to amplify their impact as they grow and make connections among each other. There are more projects in CCRI that are relevant, and the results will be available in the CCRI Knowledge Hub. The HOOP project is recognised as one of the building blocks of the CCRI community.

Finally, Ms Blondel indicated that the CCRI is about to launch a knowledge hub that proposes to host the HOOP tools and materials. She reminded the HOOP Partners that the European Commission is here to support them with the continuation of the HOOP project and Network.

HOOP co-coordinator, **Martín Soriano Disla** (CETENMA) highlighted that the impact of the HOOP project can be seen through the momentum created in cities and regions: as to mention one impact, more and more are interested in innovation procurement. Hopefully, we can continue to run HOOP assistance and to support and grow the unique community created through this project.

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4. Main takeaways

The HOOP Policy and City conferences brought together about 100 participants, among which 33 representatives of HOOP Network members. The attendees had the opportunity to get inspired by panel intervention from 4 Lighthouses, 4 Network Members and 8 external speakers from high-level organisations such as EC's DG RTD, European Committee of the Regions, European Investment Bank, European Bioeconomy Bureau and the CCRI. Overall, the different panel discussions fostered interesting exchanges, and many more interactions occurred during the various breaks, which are difficult to quantify but also relevant for future cooperation among European cities and regions. One sign of the success of the event is the fact that many organisations present expressed interest to ACR+ to join the final HOOP event and study tour in Bergen. Many HOOP Members also indicated to ACR+ their interest in exploring the different HOOP services and tools, and their effective use will be closely monitored.

The HOOP Policy conference provided a good opportunity to resume the actual legal and economic challenges faced by local and regional authorities and private companies that are trying to develop and implement circular bioeconomy projects that rely on innovative technologies. Thanks to the insights of invited panellists, attendees could also overview the main economic and regulatory enables currently fostering these kinds of projects. To mention one, the recent regulatory framework evolution of the EU Fertiliser Product Regulation 2019/1009. There are also many opportunities linked with innovation public procurement of innovation, a barely known scheme that pulls the innovation from the demand side reducing the risks linked to a process/technology upscale. This scheme is regulated at EU level with an unambiguous yet clear framework, but it needs to be understood and adopted. EU and national grants to be assigned to public procurers aiming to adopt these schemes could be a great driver for its uptake. More capital could be mobilised resorting to financial entities committed with innovation that can offer blended finance options, with tailored payback periods, like the EIB. Some consultancy services, like EIB's C3 and CCRI projects, can be of help in finding the best financing option or project pipeline to bankability.

Speaking of barriers, the EU Animal By-product regulation 1069/2009 can be considered a chance for the safe valorisation food waste, but DG SANTE and EFSA are invited to reflect on the necessity to revise the end-point criteria, especially for biowaste-derived products obtained via thermal and hydrolysis processes. The regulation is also very complex and Member States should support stakeholders with the interpretation of this regulation and the application for "alternative method for treatment of ABP".

Beyond these national and EU schemes, it is important to also acknowledge the fact that circular bioeconomy faces overarching barriers, such as the significant support that fossil-based industries still receive, the unbalanced attention given to energy recovery over bio-based materials and products, and the lack of a market for such products, all negatively impacting the competitiveness of bio-waste-based value chains and making it challenging to identify solid business models.

When it comes to local level strategies implemented by our testimonials, The HOOP Lighthouses presented many different innovative projects that could inspire the HOOP members: innovative technologies such as pyrolysis and enzymatic digestion, the production of volatile fatty acids from sewage sludge and soil additives

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from organic waste, the fermentation of used cooking oils and production of functional ingredients from spent coffee grounds, or the production of insect fed with organic waste, microalgae cultivation from biowaste, and food waste recovery to make feed, but also good practices to secure citizens' engagement and to improve the capture rate and quality of collected biowaste. A great attention was given to the key role of selective collection to guarantee a good quality of the biowaste. HOOP members have shared their strategies and stressed on the impact of being part of a network of cities to advance their practices based on exchange of experiences.

Parallel workshops allowed the exchange among cities on topics defined as key by the HOOP network: valorisation technologies, financing and funding, stakeholder engagement, and public procurement of innovation. These sessions provided an opportunity for HOOP Members to ask more direct questions to HOOP experts and Lighthouses, leading to more detailed insight.

Events like the HOOP City Conference are a great opportunity to bring together local players and technical experts, fostering interactions and make them more aware of the support services. This highlights the relevancy of such replication action, of dedicated budget allocated to cover the travel costs of local and regional experts to ensure their active participation in an inclusive way, and the need of in-person interactions for matchmaking activities and direct exchanges on more specific topics and day-to-day challenges faced by local players.

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Annex 1: HOOP policy recommendations

Over the course of the HOOP project, partners and especially HOOP Lighthouses, faced different barriers and challenges for the implementation of circular bio-based solutions taking advantage of innovative biowaste and urban wastewater sludge technologies. This section aims to list them and propose general recommendations on how to overcome them.

Introduction

The HOOP project is meant to propose policy recommendations addressing the barriers and opportunities faced by the HOOP Lighthouses and HOOP Network Members in their transition toward more circular bioeconomy strategies, systems, and projects. The HOOP project mostly focused on the exploration of innovative valorisation routes for biowaste and wastewater sludge, with the objectives to produce high-value products in addition or replacement of more traditional ones, such as compost or digestate. These high-value products have the potential to yield higher environmental and economic benefits, e.g. by fostering new economic opportunities, or producing resources or products that can be substituted for linear, fossil-based ones.

However, circular bio-based systems generally face important challenges: waste is subject to a strict regulation which might limit its applications or impose significant constraints in terms of controls or administrative burden. Besides, collecting and processing biowaste is expensive, and no financing mechanism such as EPR system is available at EU level to compensate the extra cost of separate collection for biowaste. Setting innovative recycling routes for key fractions can also face other challenges, such as insufficient local quantities produced or captured, insufficient quality of feedstock, fluctuation of generated quantities, or competition with other valorisation routes.

HOOP work on policy barriers and recommendations

The HOOP project has led several activities focusing on policy barriers and recommendations:

- **ROOTS initiative**: HOOP is part of the *ROOTS initiative* (circulaR pOlicies for changing the biOwasT System) bringing together different EU projects including Mother Projects: *VALUEWASTE*, *SCALIBUR*, *WaysTUP*, and *CITYLOOPS*. The initiative aims to draft and promote key policy recommendations for the uptake of circular bioeconomy in Europe. Different workshops and meetings were organised in the framework of the ROOTS initiative. A workshop was organised on M17 (23 February 2022) where different cities and regions (including some of the Lighthouses) exposed current policy barriers. A summary of the ROOTS policy recommendations is given below.

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- **Collaboration with other projects and initiatives**: HOOP collaborated on policy recommendations with its Mother Projects (ValueWaste, Scalibur and WaysTUP!) during working groups taking place in December 2020 and March 2021. The HOOP project had a close collaboration with the Circular Cities and Region Initiatives, especially its "Thematic Working Group" on bioeconomy. Besides, the HOOP project participated to a focus group on policy barriers and recommendations organised by the *H2020 DECISIVE project* in October 2021, where five EU funded projects shared their reflection on the topic.

- **Regulatory assessment of the selected processes and bioproducts**: it was conducted within task 3.3, and the main conclusions are presented below.

- **Survey to HOOP Network members:** a survey was addressed to the HOOP Members (70 in total at the time), to which 28 participants replied. Among others, questions were asked on the most pressing policy barriers preventing from the transition to a circular bioeconomy. Most respondent listed the economic challenges to invest and operate biowaste management, while many also indicated the animal by-product regulation and the lack of clear targets.

- **HOOP Policy conference:** the public conference was organised on 4 June 2024 and included two sessions: a first one on regulatory and economic barrier, and a second one on policy drivers. They brought together HOOP Lighthouses providing testimonies from local players, but also high-level experts that shared insights on barriers and drivers.

Legal barriers for technologies

The HOOP project conducted an extensive inventory of existing innovative technologies to process biowaste, urban wastewater sludge, or the output of composting and anaerobic digestion. The mapping included an overview of the current (legal) barriers that currently hinder their uptake in the European Union.

The table below lists the main identified legal barriers for the different technologies investigated by HOOP:

Table 1. Main legal barriers identified for innovative circular bio-based technologies applied to biowaste and urban wastewater sludge

Technology	Identified barriers	Topics at stake	Outlooks
Bioprocess involving methanotrophic bacteria using biomethane	• Potential limits for the use as feed for the feedstock used for biogas production. • No certification as novel food, need to finetune safety provisions	ABP regulation Novel food	Good results for current safety tests

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Technology	Identified barriers	Topics at stake	Outlooks
Insect fed	• Limits on the feedstock that can be used as feed	ABP regulation	Some insects already allowed as novel food
Microalgae cultivation	• No targeted regulation • Limited application as nutrition (food and feed) depending on the growth media used	Feed regulation ABP regulation	Need of studies on the safety of microalgae produced with biowaste
Volatile fatty acids (VFAs) **production from UWWS**	• End-of-waste status needs to be clarified, as the anaerobic digestion process is not complete • Limits if nutrition applications foreseen both from biowaste or from UWWS	End-of-waste criteria	An application for nutrition purposes of VFA's from biowaste was rejected by EFSA
Slow pyrolysis	• Use of biochar in agriculture might require harmonisation among MS • Clarification required when ABP used as feedstock and scope is fertilisers (not feed) • Not recognised as treatment method of ABP • Ambiguity on the requirements in IED. Incineration rules apply.	ABP regulation IED	It is not included in the ABP end point criteria just because it has not been studied, even though temperature is much higher than current methods providing end point
Production of functional **ingredients from spent** **coffee grounds**	• Limitations linked with caffeine-content • Safety studies required for application as food supplement • End-of-waste status	Novel food	-
Hydrothermal **Carbonisation (HTC)**	• UWWS not included as allowed feedstock for CMC14, but UWWS soil application allowed under certain conditions • Ambiguity on the requirements in IED	FPR regulation Sewage Sludge Directive IED regulation	

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Technology	Identified barriers	Topics at stake	Outlooks
Succinic acid production	• Restrictions for food and pharma application due to ABP	ABP regulation	-
Production of mycelium	• EFSA and the inclusion in the Novel Food list required • No specific harmonised standard on insulation materials made with mycelium	Novel food Construction standards	
Bacterial cellulose production from hydrolysed OFMSW	• Restriction if feedstock included in ABP Regulation • Lack of targeted regulation	ABP regulation	
Isolation of fibres from green waste	• Lack of specific legal frameworks for the different construction applications • Cannot be applied to plants listed in the Invasive Alien Species Regulations	Construction Materials Regulation Invasive Alien Species Regulations	
Fermentation of used cooking oils	• Restriction of application due to categorisation of UCOs as “catering waste”	ABP regulation	

Not all technologies seem to face legal barriers, and it seems that most identified barriers have to do with application of end-products for nutrition: food and feed. Overall, the main legal barriers identified are on the following topics:

- **Animal by-products (ABP)**: the fact that separately collected kitchen waste is considered as ABP (namely “catering waste”, included in Category 3) means that processes have to follow the requirements set by regulations 1069/2009 and 142/2011. The applicability of ABP Regulation restricts the use of end-products made of feedstock containing ABP, especially when referring to “catering waste” for food and feed application, even affecting fertilisers.

- **Food and feed regulation**: some products lack a certification and safety studies to be used as novel food and feed.

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- **Lack of specific/harmonised regulation**: this concerns for instance the lack of end-of-waste criteria for Volatile Fatty Acids produced from Urban Wastewater Sludges, the inclusion of biochar and hydrochar in the fertiliser product regulation or different status among Member State, or the lack of harmonised standards for insulation materials made with mycelium. The lack of harmonisation also comes from the fact that the rules established by the FPR are optional.

- **Classification of process**: this applies to pyrolysis, that is considered as incineration by the Industrial Emission Directive as soon as it is applied to waste, despite the fact that the production of biochar with biowaste is material valorisation.

- **Invasive Alien Species Regulations:** it prohibits their material recovery and only allows their destruction.

The legal barriers concern both the EU regulations and their transposition and enforcement by Member States. However, it must be noted that this approach “technology by technology” does not necessarily encapsulate the complexity of the challenges faced by the HOOP Lighthouses when undertaking innovative circular bio-based projects.

Barriers faced by HOOP Lighthouses

During the HOOP project, 8 “Lighthouses” representing 8 European cities and regions explored different technologies through the provision of Project Development Assistance. The Lighthouses have not only explored the technical and technological aspects, but also the financing and funding, potential business models, and legal implication.

Even though the project is not over, each Lighthouse has reflected on their progress and challenges in the framework of a report to share their findings for other public authorities in their respective countries. This allowed to list the main identified barriers hindering the uptake of innovative circular bio-based technologies, listed in the following table:

Table 2. Main barriers identified by HOOP Lighthouses when exploring the innovative technologies pathways.

Category	Identified barriers
Legal	
Regulation on end-products	▪ Animal By-product/TSE regulation limits the feedstock that can be used for insects ▪ Legal barriers for waste-based products
Transposition of EU directives	▪ Different interpretation of standards set by the regulatory framework ▪ Lack of harmonisation of national regulatory framework (e.g. fertiliser products)

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Regulation and innovation	▪ Lack of visibility on upcoming regulations or amendments of the existing ones impacting selection of innovative technologies ▪ Lack of specific regulation for biowaste-based products
Economic	
Capacity of (public) waste organisations to invest	▪ Inflation, energy prices, etc. limit the capacity for companies to invest in development activities
Finding (private) investors	▪ Energy crisis has impacted the outlook for biotechnologies ▪ The short-term horizon of investors does not match with the time required for upscaling innovative technologies and adapting regulations.
Grants and funding opportunities	▪ Complexity of application process, uncertainties to receive funds even when the project is approved ▪ More funding for renewable energy than for circular bioeconomy ▪ Lack of funding for the phases between pilot and full scale ▪ National funding schemes sometimes exclude certain technologies
Public procurement	▪ Difficulty to use Open Market Consultation and innovation public procurement due to lack of experience, skills, or capacities at local level
Economic balance of biowaste management	▪ Extra costs occurred by biowaste management and need to revise contracts ▪ Lack of incentives for biowaste recycling/recovery
Other	
Feedstock	▪ Low availability or lack of quality of biowaste due to failing collection systems
Knowledge and evidence	▪ Lack of clear evidence on innovative technologies and long-term vision for rolling them out.
Markets	▪ Lack of steady market for end-products

While legal barriers were well identified (and quite similar to the ones identified during the inventory of technologies), the HOOP Lighthouses also listed many economic barriers such as the lack of funding and financing opportunities targeting circular bio-based projects compared to the ones focusing on renewable energy, or the costs occurred by biowaste collection and management in a difficult context for public authorities, especially considering the lack of incentives in some places, or the lack of steady market for considered end-products.

Barriers are very dependent on the technologies explored, the situation of the Lighthouse (e.g. the maturity of biowaste collection), and their national/regional framework (existing national funding schemes, existence of economic instruments rewarding high-performing biowaste management systems, etc.).

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ROOTS policy recommendations: circulaR pOlicies for changing the biOwasTe System

The joint initiative ROOTS[1] (circulaR pOlicies for changing the biOwasTe System) brought together 5 Horizon projects, HOOP, VALUEWASTE, SCALIBUR, WaysTUP! and CITYLOOPS, to deliver policy recommendations aiming to promote circular bioeconomy solutions, focusing on innovative recycling routes for urban biowaste and wastewater.

Among the different recommendations formulated by the initiative, the following ones are the most relevant for HOOP, targeting more EU and national policies, and still key now:

- **Recommendations for promoting biowaste management:**
    - **The introduction of mandatory recycling target for biowaste**: even though it is now mandatory to separate biowaste, the lack of quantitative target might limit the ambition of local collection schemes.
    - **The introduction of support mechanisms for new biowaste treatment plants**
- **Recommendation for facilitating the recovery of biowaste:**
    - **Establish criteria for the End-of-Waste status for several types of urban biowaste** (food waste, garden waste, etc.) to clarify and simplify the end-of-waste procedures.
    - **Create specific categories for products coming from biowaste,** with their own requirements, allowing for multiple re-uses, aligned with the principles of the circular economy.
- **Recommendations for more specific bioproducts:**
    - **Revise the regulations 767/2009 (EU a, 2009) on the placing on the market and use of feed (Annex III Chapter 1.6) and 1069/2009 (EU b, 2009)**. This would allow biowaste feedstock that does not contain material of animal origin, or biowaste feedstock that fulfils the requirements, to ensure that the insect feed complies with the technical, environmental and safety requirements, as well as with the requirements for management systems to demonstrate compliance with the criteria, including for quality control and self-monitoring, and accreditation, where appropriate
    - **The Revision of Regulation 1069/2009 (EU b, 2009) (Art.5) in order to set or to allow the conditions for setting the end-point criteria related to the production of feed for farmed animals**, so that it is clear when the bioproduct stops being a derived from animal by-product.

The ROOTS initiative also calls for **more possibilities for investments** e.g. via Horizon Europe and LIFE calls focusing on the deployment and scaling up of the identified innovative recycling routes for biowaste, and **the inclusion of circular bioeconomy criteria** in the technical screening criteria for the objective 4 (Transition to a Circular Economy) of the EU taxonomy.

[1] https://open-research-europe.ec.europa.eu/articles/3-78/v1

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Learnings from the HOOP Policy Conference

The HOOP Policy conference took place on 4 June 2024 to put in discussion the barriers and drivers faced by the project and the Lighthouses when exploring innovative circular bio-based recycling routes. The HOOP Project liaised with the CCRI to organise the event, which materialised by the intervention of DG RTD for the introduction and one representative from the CCRI CSO during the panel discussion on drivers.

During the preparation of the event, both DG SANTE and the European Food Safety Authority (EFSA) were approached to address the issue of the animal by-product regulation that is regarded as one of the most commonly faced regulatory challenge for innovative circular bio-based value-chain. Although none could join the conference, DG SANTE stated that the ABP regulation should not be regarded as a barrier, but rather as an enabler. Indeed, Article 5 of Regulation (EC) No 1069/2009 gives the possibility to define alternative methods for the endpoint for the ABP status in the manufacturing chain. These alternative methods have to undergo an assessment by the EFSA. Hence, DG SANTE considers that Member States are the ones that are in capacity of lifting this regulatory barrier. Thus, a representative of Brussels Environment, the organisation in charge of the environmental regulation including the enforcement of the ABP regulation in the Brussels Region, was invited to the panel.

The HOOP policy conference provided more concrete elements on the **barriers faced by local players**, and put in discussion some of the aspects presented above:

- **LIPOR** (Porto) reported the procedure introduced in 2023 to define an alternative hygenisation method for its compost, to avoid the need to resort to the EU transformation standards of 70°C for 1 hour with a maximum 12mm particle size. While the procedure is promising, it is considered as a complex and lengthy process.

- **AWM** (Münster) related the challenges of implementing a pyrolysis plant to produce biochar: its classification as incineration in Germany, subjecting it to strict requirements, and the difficulty to obtain a declaration of conformity for biochar, considering that only one entity delivers them in Europe.

- **BIR** (Bergen) reported the lack of specific regulation on insect farming or the lack of clarity of the regulation on single-cell protein, which limits the feedstock that can be used as well as the valorisation as food and feed. This situation makes projects relying on such technologies too risky for investors.

The panel discussions shed light on further elements on the legal barriers that are interesting to consider within the framework of the HOOP policy recommendations:

- The testimony from Brussels highlighted the challenges for administrations to address the Animal By-product regulation: it is a very technical regulation that has to be interpreted by mostly jurists, leading to a strict application of the requirements listed in the regulation, and much reluctancy in defining alternative methods. **Comprehensive guidelines promoted directly by DG SANTE** and explaining how the ABP regulation can be adapted to innovative recycling routes could be beneficial to reduce these apprehensions.

- The European Compost Network insisted on **the administrative burden and the complexity of complying with the regulation for compost producers**. Even if the Fertilising Product Regulation

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effectively promoted the use of alternative fertilisers, conformity assessment is still challenging in many territories. Implementing **well-established quality assurance schemes** in all Member States would considerably help with this matter.

When it comes to **drivers**, the panel discussion highlighted several interesting elements:

- The relevancy of Public Procurement of Innovation for the adoption of low-TRL solutions. However, it seems that many public authorities are unaware of this possibility.

- Technology de-risking should be considered and can be achieved by focusing efforts on the up-scale of one or few projects rather than aiming to develop many different pilot-scale units.

In his closing speech, the European Bioeconomy Bureau also reminded the competition of fossil-based industries and fossil-fuel for bio-based ones, supported by the fact that there are still incentives for the fossil-based industry. Moreover, bio-based products lack incentives when bio-based energy such as wood burning is heavily subsidized.

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Summary of the key challenges and recommendations identified by the HOOP project

Table 3. Summary of key barriers and first recommendations

Topic	General challenges	Illustrations from a HOOP Lighthouse	Regulatory framework at stake	Possible recommendations
Animal by-products	Restriction on the use of food waste/biowaste as feedstock for certain application Restriction on the raw materials that can be used as feed for insects Challenges in defining alternative methods	Restriction on the use of food waste as feed for mealworm and for the production of microalgae (Bergen) Restriction of the application of the used cooking oils projects that had to focus on cosmetics (Albano, Western Macedonia) Restriction of the use of hydrolysed food waste as growth media for diverse biotechnological processes	ABP regulation	▪ Revise the regulations 767/2009 (EU a, 2009) on the placing on the market and use of feed (Annex III Chapter 1.6) and 1069/2009 (EU b, 2009) to allow biowaste feedstock that do not contain material of animal origin, or biowaste feedstock that fulfils the requirements to ensure that the insect feed complies with the technical, environmental and safety requirements ▪ The Revision of Regulation 1069/2009 (EU b, 2009) (Art.5) in order to set or to allow the conditions for setting the end-point criteria related to the production of feed for farmed animals or other applications (fertilisers) ▪ Clarify the ABP regulation so that public administrations can take advantage of the potential adaptations such as alternative methods to define endpoints, with comprehensive guidelines or training sessions.

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	End-point for ABP condition	The projects on pyrolysis that want to process ABP cannot be eligible for CE marking. No endpoint is defined even if the temperature is 180°C (Münster, Porto) No endpoint for pyrolysis, locking the use of biochar as fertiliser when ABP is processed.		▪ The tailored definition of an endpoint per application restricts the end-application of innovation technologies. ▪ Set the end-point criteria for the application of hydrolysed food waste as other applications (growth media for biotechnology, independently from the application) ▪ Clarify the process for setting an endpoint to facilitate their application to innovative solutions.
End-of-waste criteria	Lack of End-of-Waste criteria for sorted biowaste Lack of harmonised End-of-Waste criteria at EU level for biowaste	-	-	▪ Establish criteria for the End-of-Waste status for several types of urban biowaste (food waste, garden waste, etc.) to clarify and simplify the end-of-waste procedures ▪ Create specific categories for products coming from biowaste, with their own requirements, allowing for multiple re-uses, aligned with the principles of the circular economy. ▪ Push for more harmonisation among EU Member States ▪ Establish quality assurance schemes in all Member States
Production of biochar by pyrolysis	No distinction between the pyrolysis plants for biowaste and the ones for plastics or other fractions, or depending on the end-application (soil improver vs. fuel)	This ambiguity led some Member States to apply the same regulatory framework as incineration (Munster)	Industrial Emission Directive; EU Regulation 1069/2009	Redefinition of a specific regulatory framework for the pyrolysis of biowaste for the production of biochar to encourage a more favourable classification under the Industrial Emission Directive; revise the Fertiliser Product Regulation (1069/2009) to allow pyrolysis of ABP-containing biowaste flows.

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