D6.3
Report on the engagement activities implemented through the Biowaste Clubs in the Lighthouse Cities and Regions

Version 2

Author: CSCP

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List of acronyms

Acronym	Description
AWM	AbfallWirtschaftsbetriebe Münster
BC	Biowaste Club
BCM	Biowaste Club Meeting
B2B	Business to business
CE	Circular Economy
CSCP	Collaborating Centre on Sustainable Consumption and Production
HoReCa	Hotel/Restaurant/Catering
H2020	Horizon 2020
LHs	Lighthouse Cities and Regions
NGO	Non-Governmental Organisation
OFMSW	Organic Fraction of Municipal Solid Waste
PAYT	Pay As You Throw
PDA	Project Development Assistance
SfC	Science for Change
SME	Small and medium-sized enterprises
TBD	To be determined
UCO	Used Cooking Oils
UWWS	Urban wastewater sludge
VKU	Verband Kommunaler Unternehmen
WP	Work Package

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1. Executive summary

The HOOP project aims to provide Project Development Assistance (PDA) to eight Lighthouse cities and regions for the future implementation of biobased processes for the valorisation of the organic fraction of the municipal solid waste (OFMSW) and urban wastewater sludge (UWWS). The goal is to help unlock bio-based investments and deploy local bio economies in Europe. Facilitating this change requires multi-stakeholder engagement takes place in Biowaste Clubs.

From late 2021 and early 2022, each of the eight HOOP Lighthouse Cities and Regions (LH) has set up its own local or regional Biowaste Club and carried out its first stakeholder engagement activities through Biowaste Club meetings. In order to meet each Lighthouse's target groups and goals for engagement, each Biowaste Club's set-up, format and size vary. While some are built upon existing local initiatives, others bring stakeholders together for the first time. In six Lighthouses, Biowaste Clubs are accompanied by citizen science activities (consult D6.4 in the HOOP Library). The chapters below document the stakeholder engagement activities that have taken place between October 2020 to September 2023 and what can be expected next.

The first preparatory step for establishing the Biowaste Clubs was to assess the status quo of each Lighthouse's biowaste value chain (starting M2, November 2020). Secondly, stakeholder mapping identified key actors along the value chain and assessed their interest, relevance and influence in HOOP activities as well as their connections with each other (starting M2, November 2020). Thirdly, the CSCP developed a "How to Biowaste Club Playbook" (M8, May 2021) and provided training webinars (M8, May 2021) to Lighthouse partners on the concept, tools, set-up and execution of Biowaste Clubs.

The CSCP and WP6 partners organised bilateral "Welcome Talks" with each Lighthouse and facilitated an internal presentation series for them to present to and discuss with each other their biowaste value chain, previous related work, vision for HOOP as well as challenges, promising practices and envisioned pathways for stakeholder engagement. Additionally, bi-monthly WP6 jour fixes are being used to keep all Lighthouses and HOOP partners updated on current developments in each Lighthouse. As WP6 aims to facilitate exchange of learnings and promising practices across Lighthouses and Biowaste Clubs (task 6.2). For this purpose, HOOP study tours took place in June 2022 in Almere and Münster, in October 2022 in Porto and June 2023 in Kuopio.

While in the first project year, emphasis was mostly put on understanding the different actors and defining common goals, the subsequent years focused more on implementing concrete actions. These latter ones were usually linked to tasks 6.3 – citizen science initiatives – and 6.4 – pilot actions (see the HOOP Library). In the second half of the project, the Biowaste Clubs in the 8 HOOP lighthouses were and are also looking more and more into national replication and how to share their learnings and cooperate further across cities and regions. Hence, WPs 6 and 8 are working closely together here - using the WP6 Biowaste Clubs to implement the WP8 national replication activities and vice versa.

Throughout the first three years of the HOOP project, BCMs were attended by 790 stakeholders across all eight LHs and have focused on different stakeholder groups depending on the LH. One trend that emerges when looking at the engagement activities in the eight Lighthouses together is the focus on citizens as a key target group for stakeholder engagement. All Lighthouses want to improve their separate collection rates and quality by understanding and tackling the challenges citizens face in separating their biowaste. Some Lighthouses have

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and are still carrying out citizen science initiatives to gain more insights into those challenges. A second common theme among Lighthouses is the understanding that stakeholder engagement needs to accompany any scaling up of pilots or neighbourhood activities. A third key topic is the connections and potential conflicts between EU and national legislation and the potential barriers in national legislation and policies. These issues are tackled in the ROOTS initiative[1]. In addition, there is the common challenge of creating acceptance of biobased products for the implementation of HOOP technologies to enjoy long-term success.

[1] Four Horizon 2020 projects (SCALIBUR, HOOP, VALUEWASTE and WaysTUP) working on biowaste valorisation teamed up to promote innovative solutions for the European circular bioeconomy and reduce the regulatory barriers.

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2. Introduction

2.1. HOOP Project

The EU Bioeconomy Strategy sees cities becoming major circular bioeconomy hubs, where biowaste is a feedstock for safe and sustainable bio-based products. But until now very few cities and regions have developed circular bio-based economy strategies or projects for the production of innovative bio-based products. The HOOP project aims to be the catalyst, providing Project Development Assistance (PDA) to eight Lighthouse Cities and Regions: Albano-Laziale (Italy), Almere (The Netherlands), Bergen (Norway), Kuopio (Finland), Münster (Germany), Murcia (Spain), Greater Porto (Portugal), and Western Macedonia (Greece). HOOP supports these Lighthouses in developing large-scale urban circular bioeconomy initiatives that focus on making bio-based products from urban biowaste and wastewater. The PDA provided by the Consortium partners is technological, financial, business oriented and legal and counts on the valuable participation of a board of external experts: the HOOP Circular Investors Board and the HOOP Legal advisory board.

All the developed tools and knowledge are being disseminates across European cities and regions in the frame of the HOOP replication strategy, HOOP Urban Circular Bioeconomy Hub and knowledge exchange activities like the study tours. The HOOP Urban Circular Bioeconomy Hub is accessible to any user and also hosts the HOOP Network of Cities and Regions.

Moreover, the HOOP Lighthouses count on the assistance of Consortium partners to engage stakeholders that are relevant to the uptake or urban circular bioeconomy initiative: industry, governmental actors, society and academia. Those stakeholders are then engaged in 'Biowaste Clubs' whose principles are explained in section 2.3.

2.2. Stakeholder engagement

Stakeholder engagement is a guided process in which relevant actors are included in frequent exchange and join forces to achieve a common goal. Stakeholder engagement is an ongoing, inclusive dialogue among all actors that can contribute directly or indirectly to a given goal. It is a process of agenda-setting and collective implementation of activities that are shaped according to the stakeholders' needs and expectations.

Facilitated by the CSCP as well as SfC (in Murcia) and 2GOOUT (Greater Porto), the eight HOOP Lighthouse Cities and Regions (LH) bring local stakeholders together in a dialogue platform called a **Biowaste Club** (BC). Under the guidance of aforementioned HOOP partners, stakeholders representing the quadruple helix meet at least twice per year per LH. In these meetings, they identify the main barriers, challenges and opportunities along the value chain, including their own needs and interests. They agree on a roadmap of how this transition should take place. It is up to the stakeholders to plan and carry out pilot activities together.

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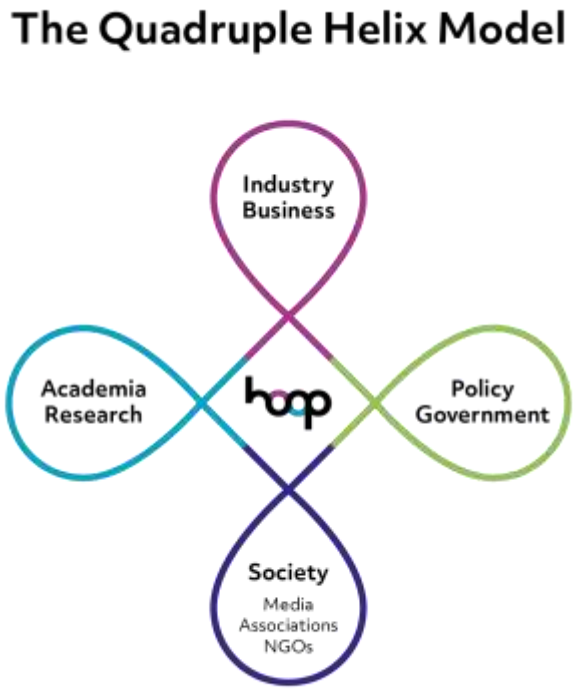
Figure 1. Sectors involved in multi-stakeholder engagement activities in HOOP



2.3. Biowaste Club concept

Biowaste Clubs are the main dialogue platform for stakeholder engagement in the HOOP Lighthouses. They are made up of key local stakeholders, such as representatives of the municipality, of waste collectors or of citizens' initiatives. Biowaste Clubs aim to foster local commitment and engagement for a more circular biowaste value chain. Specific goals of the Biowaste Clubs may be to:

- Increase consumer awareness and acceptance of urban biowaste-derived products.
- Change behaviour towards better recycling rates, in order to increase quality and quantity of the biowaste collected.
- Implement best practices in biowaste collection, transport, sorting, pre-treatment and characterization.
- Promote new, circular business models, foster social innovation and the uptake of new value chains.
- Initiate new local and national policies and initiatives.
- opportunity to build regional collaboration among cities facing the same challenges and interested in the topics investigated
- Set milestones for national action manuals.
- Collaborate with Local HOOP Committees in tracking financial and non-financial leverage of HOOP in each Lighthouse.

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To guide the LHs CSCP created a "How to Biowaste Club Playbook" and offered Lighthouse partners training webinars on the idea, resources, setup, and operation of Biowaste Clubs. More information on the concept of Biowaste Clubs can be found in the "Short explainer video about the Biowaste Clubs".

The process of organizing a Biowaste Club meeting is summarised in Figure 2.

Figure 2. Process of organizing Biowaste Club Meetings

The Biowaste Club Meetings (BCM) set-ups, compositions and formats may vary depending on the topics relevant in each Lighthouse at a given time.

This present report focuses on the period from October 2020 to September 2023 and includes the most recent developments regarding engagement activities in the Lighthouses.

2.4. Link to other HOOP activities

The stakeholder engagement in the Biowaste Clubs has in the past months oftentimes been connected to tasks 6.3 (Citizen science for optimising the separate collection of OFMSW in the lighthouse cities, led by SfC) and 6.4 (Pilot actions on education and awareness raising & acceptance of biowaste-derived products, led by CluBE).

As such, Biowaste Clubs are complemented by and often linked to citizen science initiatives in several Lighthouses. Science for Change (SfC) introduced the gamified HOOP Trainers app between 2022 and 2023 to implement a citizen science programme tailored to the needs and context in six of the HOOP Lighthouses. The data gathered through the app were analyzed in co-creation formats as Biowaste Club Meetings in several LHs. More detailed information regarding the citizen science initiatives in HOOP can be found in "D6.4 Outcome reports of the co-designed Citizen Science interventions", available in the HOOP Library.

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Furthermore, pilot activities on citizen engagement have and will be complementing the work in the BCMs. These activities are described in more detail in "D6.5 Report on the education and awareness raising & acceptance activities", also available in on the HOOP Library.

The report at hand will hence focus on summarising the key topics and engagement activities in each HOOP lighthouse. For more details on the citizen science or pilot activities, readers may refer to abovementioned deliverables.

Finally, cooperating with WP8, the HOOP learnings and best practices will also be shared on national and regional basis by the LHs in so-called National Replication Workshops. Details on the activities carried out in that frame will be available in December 2023 in D8.4 "National action manuals for local uptake and replicability", while the reader may find of interest the already published "D8.3 Guidance for the organisation of the National Replication Workshops".

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3. Engagement activities through Biowaste Clubs

In this chapter the reader can find an overview of the stakeholder engagement activities held in each of the eight Lighthouse Cities and Regions of the HOOP project. The content summarises the main topics, type of stakeholder engaged, the event format and the frequency of Biowaste Club Meetings. Due to diversity in experiences, ambitions and local contexts of LH, the structures between the chapters vary slightly to accommodate the most relevant topics in each Lighthouse.

Table 1. Overview of Biowaste Club Meetings held per LH from Oct 2020 to Sep 2023

No. of BCMs	#1	#2	#3	#4	#5	#6	#7
Albano Laziale	√	√	√	√	√		
Almere	√	√	√	√	√		
Bergen	√	√	√	√	(√)		
Kuopio	√	√	√	(√)			
Münster	√	√	(√)	(√)	(√)		
Murcia	√	√	√	√	√		
Greater Porto	√	√	√	√	√		
Western Macedonia	√	√	√	√	√	(√)	

green = BCM carried out; yellow = BCM planned

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Over the course of the HOOP project's initial three years, in total approximately 790 stakeholders participated in BCMs in all eight LHs. In all LHs, stakeholders from all four dimensions of the quadruple helix model have participated in engagement activities (see 2.2). Depending on the LH, a focus on different stakeholder groups is identifiable, as will be presented in more detail in the course of the following chapter. Table 1 shows an overview of all BCMs held per LHs in the first three years of the project. The majority of the LHs has carried out five BCMs so far, meaning that they still need to carry out two more BCMs during the last year of the HOOP project to meet the project KPI of seven BCMs, and are thus on track. There are two LHs (Münster and Kuopio) which have currently organized a lower number of BCMs. Assuming that the LH of Münster is carrying out the BCMs currently planned until November 2023, only the LH of Kuopio will have to plan and execute three BCMs in the last year of the HOOP project.

3.1. Albano Laziale

The city of Albano Laziale is a peculiar case within the HOOP project. The city is also one of pilot cities of the SCALIBUR project (Scalable Technologies for the Recovery of Organic Waste) together with Madrid (Spain) and Kozani (Greece). This means that local partners together with the municipality have already had the opportunity to run several Biowaste Clubs meetings as well as engage stakeholders and citizens who to a certain extent were already familiar with the concepts of sustainable and circular biowaste value chains. As the duration of the HOOP and SCALIBUR project overlapped for two years, the SCALIBUR Biowaste Clubs run during that time were already linked to the HOOP project. Furthermore, building upon the gathered knowledge and insights from SCALIBUR, a series of SCALIBUR pilot activities were already implemented at the local level, i.e. sensors installation for the optimization of waste collection via routes' tracks improvements, and building up of a local reuse center and anaerobic digestion plant.

Accordingly, the initial Biowaste Club meetings ran under the HOOP's project umbrella built upon these activities as well as further expanding them with the aim of promoting higher citizens' engagement and fostering B2B cooperation among key actors operating in the region for the market exploitation of biowaste. Focusing initially on the latter aspect, the first HOOP Biowaste Club meeting entitled *"The companies of Albano Laziale and the circular economy: opportunities for innovation in waste management"* took place in December 2021. It focused on sharing the latest progresses with respect to technologies for biowaste valorisation, to the pilot activities on-going in Albano Laziale and on connecting the objectives of those to the further areas of opportunity brought in by the HOOP project activities.

Following this kick-off event, a broader one was organized entitled "*Circular Economy Action Week"* in May 2022. The goals were twofold: firstly, it aimed to promote knowledge of emerging circular technological solutions and applications; secondly, the event focused on enabling stakeholders to exchange and discuss pathways for enhancing investments for the valorisation of the organic fractions of municipal solid waste and waste water. The week, thus, consisted of a series of ad-hoc target events, starting with a public and an experts' seminar dedicated to international best practices for the circular economy and for the improvement of individual and collective consumption models and discussions around new potential scenarios in terms of economic and employment opportunities offered by novel technologies in the field of biowaste management and valorisation. These initial events were followed by a day dedicated to participatory processes during which high school students had the opportunity to learn about the educational platform "Green Learning 360°" - promoted by ANCI Lazio and Regione Lazio and produced by Ancitel Energia e Ambiente - and to exchange and explore the future of circular cities and in particular Albano Laziale in the year 2030. The week concluded with an exhibition which

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displayed products of several companies operating in the fields of circular economy, reusing, recycling and up-cycling.

Table 2. Overview of Biowaste Club meetings in Albano Laziale

Date	No. of Stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
16/12/2021	23	Government – local authorities Businesses	Hybrid	Introduction of the HOOP project, progresses on pilot activities and respective challenges, further opportunities within the HOOP projects	1) need for systemic solutions which overcome fragmented approaches currently developed across the Lazio region 2) need of cross-sectors collaboration to expand the market potential of (bio)waste
From 17/05 to 20/05 2022	135 - 150	Government – local authorities Businesses	In person	Awareness raising on proper waste management and (bio)waste potential application, investments opportunities in the field, B2B collaboration as well as across neighboring municipalities, progresses of pilot activities	1) Citizen's engagement at the local level is still challenging when it is not directly linked to the PAYT system 2) B2B collaborations have great market exploitation potential in the region 3) Further discussions are needed to best identify: i) opportunities areas and ii) funding and financing schemes

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Date	No. of Stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
					for biowaste management and valorization given the different focus on the circular and bio-economy adopted by the Italian recovery plan
13/9/2022	42	Government – local authorities	In person	As part of the third edition of the "Training Camp - VENTOTENE 2022", the BCM for local administrators was held, an opportunity dedicated on ideas and strategies related to the recovery of organic waste to promote the bioeconomy.	1) Needs of provision of plants necessary for the treatment and disposal of the various types of waste is essential, both for urban and industrial waste, from special waste to sewage sludge, within the locations provided by the provinces 2) Importance of policies and investments to promote the reduction of waste production and the development of the circular economy
27/3/2023	18	Businesses	Online	Presentation and discussion of the business opportunities of the valorization of usesd cooking oils (UCOs) into P2HB, a biocompatible	1) The audience gave very positive feedbacks on the proposed contents and was impressed by the

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Date	No. of Stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
				biopolymer, to the main stakeholder of the valuechain in Lazio Regions: UCO collection and treatment companies and the cosmetics sector.	potential of the new value-chain 2) Each stakeholder group remarked the benefits that this alternative valorisation route for UCOs would bring to them
14/4/2023	40	Government – local authorities Businesses Academia	In person	Biowaste Club as part of the “RISCARTI” Festival, (Festival of Creative Recycling). Good practices were presented for Innovation of the recovery of nutrients from the "NOMAD" digestate and the assistance path for investments in biotechnologies through the HOOP PDA (project Assistance Development); workshops on Gamification for the bioeconomy, the "Hoop trainer" webapp.	1) Complexity of different rules between municipalities can contribute to making it more difficult to differentiate between different materials 2) Importance of having proximity systems, incentives and communication with citizens

As had emerged from the previous Biowaste Club meetings a **need for increasing B2B and municipalities collaborations** had been identified. Accordingly, a BCM was organized focusing on the different business opportunities regarding used cooking oils. This event was held online and included stakeholders from technology providers, the cosmetics sector and waste management companies. The HOOP engagement activities were also integrated in the third edition of the "Training Camp - VENTOTENE 2022". At this event a specific session was held as a BCM, where public authority administrators discussed ideas and strategies related to the recovery of organic waste.

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In spring of 2023 a BCM was organized as part of the “RISCARTI” Festival. This festival focuses on creative recycling and is open to the general public. The HOOP project was featured during different formats at the festival. A discussion on issues of urban organic waste and wastewater recovery was initiated during a public talk during the festival. Furthermore, co-creation workshops were carried out by SfC with high school students. In two events, 68 secondary students from different schools in Municipio I of Roma Capitale and in the Municipality of Campagnano worked together to transform the HOOP Trainers challenges into improvement proposals. More detailed information on these workshops can be found in "D6.4 Outcome reports of the co-designed Citizen Science interventions".

Further engagement activities, involving wider groups of stakeholders and communication with experts and journalists in order to inform about the collaborative activities under HOOP PDA are planned. Another aspect to be addressed in upcoming Biowaste Club meetings concerns the investment opportunities linked to (bio-) waste and wastewater valorization processes and measures which appear to need further alignment between the Italian national level and the European level.

3.2. Almere

Almere is a rapidly growing city that needs to build over sixty thousand homes and accompanying infrastructure in the next twenty years. Based on this need and its existing experience in producing biobased concrete, it is particularly interested in circular and virgin bio-based construction material. The challenge now is scaling up biobased construction technologies by connecting supply with sufficient demand.

A message that was repeated by various stakeholders at the first Biowaste Club meeting was that the technology for producing bio-based products already exists – albeit on a small scale. Scaling up of technologies is lagging because of non-structural market demand.

HOOP’s stakeholder engagement ambitions in Almere align very closely with existing engagement aims and activities from the Grondstoffen Collectief Almere, Grondstoffen Collectief Nederland and the Floriade Horticulture Expo to build coalitions of the willing for circular biowaste. One of the main motivations of the collectives is to help city representatives and project developers understand and decide what to do with urban waste and which technologies or companies to choose. The most recent Biowaste Club meetings have focused on plans to establish a multi-purpose fibre bank.

Table 3. Overview of Biowaste Club meetings in Almere

Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
7/3/2022	6	Government – local authorities Businesses	Online	Introduction to HOOP and stakeholder engagement, understanding stakeholders’ concerns and visions for	Need to understand perceive risks of using biobased construction material

Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
				bioeconomy, identifying stakeholders in biobased construction for future engagement	
14/3/2022	11	Government – local authorities Businesses	In person	Introduction to HOOP Project Ecosystem needed for biobased economy Focus for HOOP Projects - potential role of Cirwinn	Identified a long list of stakeholders to be involved to enhance the natural fiber chain. Public authorities, Project developers & construction companies, Companies that create manufactured products for construction, Companies that create bio-based products
4/7/2022	11	Government – local authorities Businesses	In person	Update on HOOP Project Ecosystem needed for biobased economy Focus for HOOP Projects - potential role of Cirwinn	Further developing the small pilot projects has limited chance of existence model due to limited supply and demand. GCA-stakeholders doubt to opt in for the long term
22/9/22	5	Government – local authorities Businesses	In person	Introduction to HOOP Project Ecosystem needed for biobased economy How to create a multi-fibrebank	The concept of a multi-fibrebank in which all the fibre-solutions (compost, digesting, pyrolysis, fiber material) are combined is introduced. There is more potential in combining different

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Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
					techniques than 'stand-alone' solutions
14/2/23	10	Government – local authorities Businesses	In person	Het Vezeloverleg What is needed for more fiber projects	Need to understand better the potential of fibre products. Open questions: 1. Defining product demand for natural fibre products: focusing on 2030 market demand 2. Focusing on natural fibre products that are (relatively) easy to make and in demand 3. Building business model natural fibre products: accepting that money is needed to bridge 4. Invest in market knowledge: who is our market and how do we ensure that we continuously know what the market is waiting for 5. Create understanding of urgency among governments 6. Giving initial hands and feet to the multi-purpose fibre bank concept

In addition, the city of Almere has recently changed the waste collection system by introducing a system of new bins. Accompanying this change is the dissemination of information to citizens in order to increase their awareness for better biowaste separation. In conjunction with this, the city is planning a larger publicity campaign as well as the introduction of a monitoring system to monitor the effect of this change.

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Regarding the national replication workshop (WP8) there is the consideration to align it with an annual national event on fibre plastic. The national replication workshop could be part of this event if the city of Almere were to become a co-organiser or sponsor. The advantage of integrating the workshop in this larger event is to draw more participants, as representatives from both the business sector and cities will be at the national event.

Almere is currently planning an exhibition of biowaste-based products and combining it with other events that are focusing on the circular economy. The city of Almere would like to have a mobile exhibition of biowaste-based products to bring to citizen meetings. In addition, there may be HOOP information points at open markets in the city showcasing some of these products. Discussions are ongoing to make this a permanent fixture in the Almere city hall in the future.

Finally, Almere deploys 'waste coaches' to assist citizens in reducing and better managing their waste. They provide support and advice to citizens or communities to help them reduce, reuse, recycle, and dispose of waste properly. HOOP will try to facilitate the exchange between these waste coaches and the 'bio patrols' in Murcia to explore the replication potential in other HOOP Lighthouses and HOOP Network members.

3.3. Bergen

Bergen municipality and region are in a unique geographical situation located within a region characterized by fjords that makes in-land logistics difficult and aquaculture one of the largest industries in the region. Thus, aquaculture is a dominant industry and many of the established biowaste valorisation routes, such as composting, are not as viable in the region. This is reflected in the BCMs that have happened in the Bergen lighthouse, where material flows and valorisation routes towards circularity not related to composting have been in focus. In addition, the innovative Bergen region with many research institutes, universities, start-ups and established industrial companies has actors that are relevant in terms of circular bioeconomy solutions. Bringing those actors together to establish potential symbiosis has been another key topic in Bergen since many waste or side streams from one actor can become a valuable resource for others.

The first BCM focused on informing participants about the HOOP project but also the CE landscape in Bergen municipality and region. This included visions of not only the public bodies but also stakeholders like BIR that are relevant to the urban circular bioeconomy. Besides opportunities for stakeholders to discuss topics such as separate collection and waste treatment, the BCM also gave the opportunity to showcase innovative and circular examples through study visits. An algae research facility, local small-scale composting solutions, a circular economy fair and the innovative underground PAYT containers within the city were visited together, to foster better understanding of the bioeconomy and biowaste situation in Bergen.

After the first BCM successfully showcased that collaboration between actors is one of the keys to success this notion of symbiosis thinking was enhanced even further for the second BCM. After initial introductions of the HOOP project and the biowaste club concept to new stakeholders several key stakeholders got the chance to host roundtable discussions with the participants. The co-hosts included research institutions, market solutions for secondary resources, BIR itself, regional bodies and an industrial cluster. With focus on topics such as biomaterials, industrial symbiosis, raw material sourcing for scale-up, technological solutions or the build-up of market place solutions. This way, targeted discussions with the up to 50 participants were possible and information about existing initiatives in the region could be shared.

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The Bergen lighthouse is working intensively towards establishing a so called “Biopark” in the region of Voss, a bordering region close the Bergen in Norway. In relation to this, multiple engagement activities have taken place in the first quarter of 2023. First, an event with multiple target groups including the board of directors at BIR, representatives from other municipal waste companies and the management group at BIR were targeted in a workshop with the aim of thinking of new ways to establish the urban circular bioeconomy. This Biowaste Club Meeting managed to raise the awareness with those relevant stakeholders and increased the sensitivity for such relevant topics and fed into the planned and ongoing activities in regard to the Biopark.

The second event in relation to the establishment of the Biopark, was a vast conference which took place at the site of the Biopark. Besides a bigger workshop with many stakeholders that focused more on the biopark itself and hence is not considered a BCM, a BCM was held with representatives of other Bioparks. This resulted in discussions about similarities and differences, product development and markets, and overall networking and collaboration. The regional collaboration could be enhanced and support the overall ongoing developments in the Biopark that will closely work together with BIR.

Table 4. Overview of Biowaste Club meetings in Bergen

Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
20/9/2021	22	Government – local authorities Businesses Academia	In person	Introduction to HOOP and stakeholder engagement, Bergen CE strategy, introduction of separate sorting, implementation of symbiosis thinking, local adapted solutions, dissemination of best practice examples	Collaboration between stakeholders necessary, BCM can be the forum for that
31/3/2022	50	Government – local authorities Businesses Academia	In person	Key topic of industrial symbiosis in the region and potential for collaboration. Including round-table discussions facilitated by different co-hosts including waste management companies, research, industrial actors & market actors	A lot to discuss and explore in terms of collaboration in the region, additional formats such as this needed

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Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
1/2/2023	19	Businesses Government – local authorities	In person	The goal of the event was to increase the participants awareness of the circular bioeconomy and get them discussing key factors for success in creating a biopark at Voss	The main topics were: • *Property and development of infrastructure* • *Organising the development* • *Competitive advantage* • *Strategic communication* The event was truly successful in increasing knowledge about the bioeconomy and touched on some of the demanding challenges that will need to be discussed and worked through in order to create a successful park
29/3/2023	10	Businesses	In person	The goal of the event was to discuss differences between the three parks, regional differences and challenges, product development, networking and forging relationships for further collaboration.	Successful event for more regional cooperation
11/2023 **(foreseen, TBD)**	30+	NGOs Citizens	In person	Engagement of Citizens with the support of Local Champions during the Reuse Week in November.	TBD

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Building on the success of the BCMs surrounding the Biopark in Voss, this will also remain an opportunity going forward. Both BCMs as well as national replication workshop will be focused in the 2024 edition of the conference which both will pay dividends to the HOOP activities. In addition, several target groups might be targeted in upcoming BCMs in the HOOP lifetime. This includes some local initiatives and pioneers that work towards supporting the urban circular bioeconomy in Bergen and could be linked to the so-called Reuse-Week, an event that was previously hosted in Bergen, where many actors inform about reuse and other circular economy and sustainability related activities. In addition, BIR is working on reports in parallel running projects that might be leveraged for joint events for HOOP and other parallel projects. Beyond this, BIR is constantly organizing events with stakeholders in other contexts and will continuously search for links to the HOOP project, to have both the project and also the activities benefit from one another.

3.4. Kuopio

The first Biowaste Club meeting took place on 9 June 2021. In attendance were value chain actors Jätekukko Ltd, Gasum Ltd, Kuopion Vesi Ltd, the municipality of Kuopio, and SAVONIA University of Applied Science. An outcome of the meeting was a clearer understanding of the interests of each stakeholder and the barriers they currently face in their work regarding waste management. Following this first meeting, SAVONIA led bilateral meetings with each of these stakeholders at the end of 2021 to discuss further potential activities and developments in detail.

The second BCM was held at Lumit, Kuopio's high school for fine arts on 13 December 2022. The four key issues discussed were school lunches, utilising leftover food, biowaste at home, and what could the City of Kuopio do better. Since all of the participants where in a way or another connected to schools, the focus of the conversation stayed quite naturally at food waste generated at school lunches, more precisely at ways to reduce the generated amount of food waste and how to utilize the leftover food. The key action points resulting from the meeting was to involve the entity in charge of school lunches; to arrange the utilisation of leftover food; and to unify the sorting practices in Kuopio’s public facilities and communicate about them.

The third BCM was a hybrid event on 9 February 2023. In the meeting, participants discussed how to increase the separate collection of biowaste at lunch restaurants, looking at best practices from a local restaurant, including using AI to plan lunch menus and separately collecting spent coffee grounds.

Table 5. Overview of Biowaste Club meetings in Kuopio

Date	No. of participants	Types of Stakeholders	Format	Focus	Main conclusions
9/6/2021	5	Businesses Academia	Online	Introduction to HOOP and stakeholder engagement, understanding stakeholders’ barriers, opportunities and	1. Limited kitchen space in private households is a limiting factor

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Date	No. of participants	Types of Stakeholders	Format	Focus	Main conclusions
		Government – local authorities		motivations for bioeconomy	2. Tap into new national campaign for sorting 3. Technology for bioplastics from predecessor projects would be interesting
13/12/2022	10	Academia Schools	In person	School lunches, utilizing leftover food, biowaste at home, and what could the City of Kuopio do better	1. Leftover food should be distributed to students or food aid 2. Season the food differently depending on where it is being eaten 3. The company responsible for preparing the food should not benefit from the wasted food portions
9/2/2023	5	Businesses Academia	Hybrid	Increasing the separate collection of biowaste at lunch restaurants Reducing the amount of biowaste in mixed waste in households	1. The largest amount of biowaste is generated by customers, leftover food from their plates 2. Biowaste is generated unevenly, at times so small amounts that people are not bothered to collect separately.

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Date	No. of participants	Types of Stakeholders	Format	Focus	Main conclusions
10/10/2023	TBD	University students	In person	Increasing the separate collection of biowaste at university canteens; developing design solutions Valorisation of spent coffee grounds; potential of lab pilots by environmental engineering students	TBD

Prospectively, Kuopio would like to raise people's awareness about biowaste collection and increase the separation rate. In the past, the waste management company Jätekukko Ltd developed an app to gamify recycling among households. In addition, it has run numerous information campaigns on waste reduction and awareness. However, the public response has been tepid thus far. It seems that the low separate biowaste collection rate among households is not due to a lack of awareness or knowledge. For some households, a lack of space in the kitchen may create a barrier to sorting.

The next Biowaste Club meeting is planned for October 2023 and will target students at Savonia UAS.

3.5. Münster

The HOOP partner in Münster is the local municipal waste management company whose customers are mainly the citizens. There are already several high-level operations ongoing in terms of valorization such as the compost production from different waste streams or the biogas production. More technical solutions are planned within HOOP but the similarity for all is that the quality of the biowaste is one of the key factors in the successful implementation of those technical solutions. Hence, the stakeholder engagement also aims in at discussing those topics and critical aspects.

The BC in Münster has adopted the German name "Biomehrwert Initiative Münster". The first meeting aimed at introducing HOOP and the BCM concept to participants while also giving vast background information on many biowaste topics both within Münster and the AWM structures as well as in the wider context of biowaste management in Germany. The discussion phase focused on several aspects such as how the separation behavior of citizens could be further improved or potential initiatives to launch in certain neighborhoods in Münster. With technical experts and also civil society representatives present, many perspectives in the discussions were taken up.

The second citizen-centric focus of the Biomehrwert Initiative Münster continued on 15 September 2022. The focus of the meeting was to discuss ideas and solutions for the large building complexes housing multiple

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families. These complexes are main contributors to impurities in the Münster biowaste collection. Together with technical experts, owners and managers of large building complexes in Münster, civil society representatives and AWM experts, promising practices were discussed regarding engaging, informing and motivating citizens living in the building complexes, including a focus on marginalized groups such as refugees.

Table 6. Overview of Biowaste Club meetings in Münster

Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
23/11/2021	12	Businesses Academia NGOs	Online	Introduction to HOOP and stakeholder engagement, opening event of the Biomehrwert Initiative, technical status of the biowaste monitoring, Status of the biowaste campaigns, discussion cooperation Twente, separation behaviour	Developing neighborhood initiatives and further informing and engaging citizens is an ongoing effort
15/9/2022	16	Businesses Academia	Hybrid	Challenges for biowaste collection indense urban structures, Waste consulting in refugee accommodations, Aktion Biotonne Münster! Results of the controls at large residential properties, Outlook - New approaches for the reduction of contaminants in the (bio-)waste collection in Münster	Challenges in engagement in large housing complexes and ideas for pilots
23/09/2023	4-7	Citizens	In person	Hands-on workshop on pyrolysis. Assisted construction of	TBD

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Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
				self-made pyrolysis ovens (Atmoco) for the production of biochar using green waste at AWM premises. Discussion of biochar opportunities for Münster.	
26/09/2023	10+	Citizens	In person	Co-creation workshop on the citizen science app with pupils approximately aged 14-15 years. Topics will include analysis of the collected data and more general discussion on the challenges regarding waste collection and valorization.	TBD
11/2023 **(foreseen, TBD)**	20+	Government – local authorities Academia Businesses	In person	Exploring the potential for the implementation of a pyrolysis plant to create biochar in Münster. Experts with extensive knowledge of pyrolysis, the operation of such plants and connected business models (e.g. fields of application for biochar) will provide valuable input and will initiate discussion points for local implementation.	TBD

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One of the main focus points for AWM in HOOP is exploring the possibilities of building and operating a pyrolysis plant in order to produce biochar as a novel bio-based product. While many of the ongoing HOOP activities already work towards this goal, an upcoming BCM in Münster is ought to also support this cause. For this, it is planned to conduct a meeting within the Biomehrwert Initiative with several target groups. One target group contains experts with vast experience on pyrolysis and the operation of such plants. In addition, potential customers, both from the gardening departments of the city of Münster but also the agricultural sector (e.g. commercial soil producers) will be invited in order to discuss potential markets and the business case.

Another string of activities in Münster focuses more on the engagement of civil society. In connection with HOOP Task 6.3 (see also report D6.4); the developed citizen science app has been running for several months and helps in understanding citizen behavior. Based on the results of the app, currently AWM is planning to run a joint co-creation workshop with pupils to build on the collected data and derive additional actions and recommendations for the AWM work in Münster. This BCM is planned for September 2023. Also, in September in connection to Task 6.4 a workshop on building small pyrolysis ovens will take place. In this BCM local citizens will have the opportunity to test the pyrolysis mechanisms themselves. Part of this workshop will also be an interactive session to discuss the advantages and disadvantages of pyrolysis.

While the previously mentioned activities mostly focus on the local and regional level, there will also be several activities conducted on at least state, if not national level. AWM is active in the German Association of Local Public Utilities of municipally determined infrastructure undertakings and economic enterprises (VKU). Both the AWM and the second German HOOP consortium partner, the CSCP, have started to lay the groundwork through establishing contact with relevant personnel within the association, hosting first workshops and informing about the HOOP project. Based on this, additional activities will be planned in the remaining HOOP project time depending on the needs and opportunities the association presents.

3.6. Murcia

The municipality of Murcia, represented in HOOP by the City Council (Ayuntamiento de Murcia), is the capital of the autonomous Region of Murcia, in the South-East of Spain. Due to the climate and the large tourist and agricultural sectors (both of them being highly seasonal), the waste compositions, qualities and amounts in Murcia vary a lot with the seasons, which is a key challenge in the waste management. Additionally, the climatic conditions and the intensive agriculture require a big emphasis on water recovery – also in the stakeholder engagement of HOOP. The stakeholder engagement and Biowaste Club in Murcia are facilitated by the HOOP partner Science for Change (SfC).

OFMSW is so far only collected in few pilot neighborhoods of the city and food markets, within the ValueWaste mother project. One goal for Murcia for the HOOP project is, thus, to extend this collection to more parts of the city. With extending the collection, also citizen engagement activities will have to be upscaled and improved accordingly. Next to increasing quantities, also the quality of the already collected OFMSW still needs to be improved in order to be able to use it for further valorisation. Also herein lie many opportunities for engagement.

Next to working with households and different citizen initiatives, also collection from HoReCa, retail sector and food processing industries is envisioned. Engaging these actors will, hence, also be crucial for stakeholder engagement and the Biowaste Clubs in Murcia. Some of the challenges in the HoReCa and retail sector and ideas how to work further with them, have already been identified in the first HOOP BCM in Murcia.

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Given that SfC is specialized on citizen engagement and co-creation and that also CETENMA and Murcia City Council have already been running extensive engagement activities together within ValueWaste, Murcia's BC is well positioned to achieve a wide citizen engagement and to take the engagement to the next level. A first exciting step in this direction has already been taken with the 2nd Biowaste Club Meeting, which took place in February 2022 (back-to-back with Murcia's first Circular Economy fair). Here participants took up the identified pathways from the 1st BCM and co-designed awareness raising collages to disseminate key messages. SfC turned these collages into 16 digital postcards gathered in the padlet platform in order to engage citizens further through social media. Thus, citizens took virtually part in this collective exercise by rating how relevant/important was the message of the postcard to move towards the circular bioeconomy and commenting on them. In the Spanish version, the most voted key message to convey the concept of circular bioeconomy and reflect on it was "Learn from your grandparents, circularity is already invented". In the English version the most voted message was "Let's rely on technology. From the lab to the farm, from the farm to the lab". The Spanish postcards had a total of 35 reactions and the English a total of 50.

Also, Murcia was one of the first HOOP Lighthouses to test and implement the HOOP citizen science app. For this, a first co-creation workshop with the city of Murcia and SfC was organized to identify the key topics relevant for citizen science and for the app development in Murcia. The app was then launched and promoted in Murcia by beginning of 2023 - aligned with the implementation of the new OFMSW selective collection bins of the city. Two special Biowaste Club Meetings were held in April and May 2023 to analyse and discuss the results from the app and – based on these results - conclude on possible ways to improve the waste management in Murcia region. A more detailed summary of the discussions and results can be found in deliverable D6.4.

In April 2023, Murcia also held a Biowaste Club Meeting on the challenges of the industrial sector to implement circular bioeconomy strategies. The event was co-organized with the European project Agro2Circular and included stakeholders from companies, universities, associations and other projects. Two working groups focused either on the topic of plastics, packaging and its relationship with the agri-food industry or the topic of technological and economic profitability challenges to implement the circular bioeconomy. The working groups co-developed potential solutions for the identified challenges, which will be addressed in future BCMs to shape more concrete collaborative actions to overcome them.

Table 7. Overview of Biowaste Club meetings in Murcia

Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
25/11/2021	12	Businesses Government – local authorities Academia	In person	Introduction to HOOP and stakeholder engagement, understanding stakeholders' barriers, opportunities and motivations for bioeconomy. Discussion of possible first citizen	Key challenges for citizens and households in waste separation identified Challenges in working with HoReCa and retail sector

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Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
				engagement activities in Murcia.	
10/2/2022	30	Businesses Government – local authorities Academia Citizens	In person	Co-designing of awareness raising collages/ linking to Murcia's Circular Economy fair	Co-design of awareness raising campaign Agreement on key messages for citizen engagement Design of digital engagement cards
25/4/2023	39	Citizens	In person	Co-creation workshop with secondary students to analyse the outcomes obtained in HOOP Trainers and transform them into recommendations to advance towards circularity.	The reflections delved into the factors motivating and hindering waste sorting, as well as the preferred communication channels for obtaining information. The detailed recommendations that emerged during the session can be found in the "D6.4 Outcome reports of the co-designed Citizen Science interventions".
26/4/2023	11	Businesses Academia Government – local authorities	In person	Challenges of the industrial sector to implement circular bioeconomy strategies	Key needs for the industrial sector to implement circular bioeconomy were identified. Opportunities for further collaboration

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Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
					among companies were discussed.
17/5/2023	12	Citizens	In person	Co-creation workshop with social agents to analyse the outcomes obtained in HOOP Trainers and transform them into recommendations to advance towards circularity.	The reflections delved into the factors motivating and hindering waste sorting, as well as the preferred communication channels for obtaining information. The detailed recommendations that emerged during the session can be found in the "D6.4 Outcome reports of the co-designed Citizen Science interventions".

3.7. Greater Porto

The Greater Porto region is located in the North-West of Portugal. For the HOOP project, the region considered covers eight municipalities (Espinho, Gondomar, Maia, Matosinhos, Porto, Póvoa de Varzim, Valongo and Vila do Conde) in North-western Portugal and is represented by LIPOR (Municipalities Association for Sustainable Waste Management of Greater Porto). This geographic scope for HOOP was determined by LIPOR's operating radius.

In the Greater Porto region there are approximately one million inhabitants. The main economic areas are services, tourism, construction and agriculture. OFMSW is separately collected in Greater Porto region from a growing number of households, HoReCa actors, markets and public green spaces.

While so far "only" some of the households of Greater Porto region are participating in the separate collection, there are still various challenges hindering the engagement and motivation of citizens. At the same time, LIPOR has already run various successful communications campaigns, resulting in high awareness and motivation levels in some neighbourhoods. Also, the engagement of and campaigning towards the HoReCa sector has proven successful, with a consequently changed and improved waste sorting behaviour.

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In order to increase the quality and quantity of biowaste collected, it will be crucial to engage the citizens and together find solutions for the citizens' current main issues. These issues include in particular 1. the wish for recognition and involvement, 2. the limited space in the kitchens, 3. the avoidance of plastic bags and other pollution in the biowaste and 4. the need for clean bins.

As also identified in Greater Porto's first BCM, in the engagement of citizens it will be important to focus on a combination of different strategies and engagement tools. Especially for those citizen groups that so far do not participate (properly) in biowaste collection, it will be an important task of HOOP stakeholder engagement to support in the development and implementation of new and more effective approaches to communicate. Additionally, focus on the citizen engagement in Greater Porto will not only have to be on education and awareness raising and behaviour change on waste sorting, but also on the social acceptance of new biobased technologies and products.

With the goal of expanding the collection scheme to the whole region, it will be crucial for Greater Porto region to focus the HOOP stakeholder engagement not only on citizens, but also to improve the cooperation across the value chain in the 8 associated municipalities. As such, topics that were identified in both the first BCM as well as in project partner meetings and that will, hence, also need to be tackled in upcoming BCMs and/or other actions include:

- The importance of creating open communication lines between the actors of the bio-waste collection and management value chain
- How to improve the communication with the citizens and acknowledge their participation in bio-waste recycling.
- The importance of investing in innovation to improve bio-waste collection and management.
- Whether and how to introduce a common waste tariff that is transparent, fair and incentivising of good practices

Also, with regard to biowaste valorisation, it will be a crucial part of Greater Porto's stakeholder engagement to seek collaboration across the 8 municipalities in order to together:

- Identify ways to overcome the currently poor economics of biowaste valorisation
- Increase acceptance of new biobased technologies and solutions, across all actors
- Agree upon the importance of and commit to shared investments both in a new biowaste treatment plant as well as in new innovative solutions for valorisation

Building upon above goals for Porto region, LIPOR held in September 2022 a Biowaste Club Meeting focusing on citizen participation. The results of a questionnaire on citizen participation in waste collection and separation were discussed and ideas developed on how to ease participation and increase interest in the topics of waste recycling and bioeconomy. These ideas fed also into the HOOP Trainers app that was developed for Greater Porto under HOOP task 6.3.

A second BCM in November 2022 focused on the acceptance of bio-based products. Representatives from different Portuguese municipalities as well as from waste management facilities of Greater Porto discussed together with HOOP partners aspects such as enabling factors, barriers and constraints for the development and commercialization of different bio-based products.

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Following this BCM, LIPOR team decided that in order to increase social acceptance of bio-based products further, a wider audience needs to be able to see, touch and experience them more hands-on. Therefore, an interactive exhibition was developed under task 6.4 and exhibited in different locations and events in Porto.

In a subsequent BCM in April 2023, the two tasks (6.3 and 6.4) came together in Greater Porto. During this meeting participants had the opportunity, firstly, to discuss the HOOP Trainers app and how the citizens' feedback from the app can further be used to improve waste collection and sorting. Secondly, participants also experienced the exhibition and focused in roundtables on different bio-based products. Questions debated included the opportunities and challenges of each product, perspectives on how to make the business case for them, as well as the still missing skills to make a bio-economy in Greater Porto and Portugal happen.

For more details on how the citizen science app (task 6.3) and the exhibition (task 6.4) were carried out in Greater Porto, see the respective deliverables 6.4 and 6.5.

Table 8. Overview of Biowaste Club meetings in Greater Porto

Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
23/9/2021	56	Government – local authorities Businesses	Online	Introduction to HOOP and stakeholder engagement, case study separate collection of biowaste, challenges associated with biowaste collection	Overview of citizens' current main issues and challenges Identification of possible strategies to engage citizens
20/9/2022	23	Government – local authorities Businesses	In person	Presentation of questionnaire results on citizen participation on waste collection. Discussion on reward for prevention of food waste production for instance through a single reward and gamification platform for waste and other services (e.g. energy, water).	Present the results of the BC to the internal team developing a study to identify the best way to engage citizen. Propose internally the development of a study concerning the development of a PAYT system applicable to the 8 municipalities (eventually wider area) while changing from the

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Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
					water bill to a new system. Plan a Biowaste Club concerning the sharing of good practices in waste collection, evidencing how a good collection is important to obtain good quality products
23/11/2022	30	Government – local authorities Academia Businesses	In person	Presentation on Stakeholder engagement method and group work on different bio-based products, addressing aspects such as enabling factors, barriers and constraints for the development and commercialization of products	Municipalities, partners, follower cities and regions are interested in new bio-based products but there is still not enough information on the subject
14/04/2023	40	Businesses Academia Government – local authorities	In person	Demonstration of the HOOP trainers app, with the involvement of participants in Game 1. Presentation of 4 Portuguese case studies of biobased products - Biochar (IM Florestal); Biocomposites (Spawnfoam); Natural food ingredients (AgroGrIN Tech); and products from the	Integration of the product exhibition on the visit to LIPOR composting plant Preparation of an exhibition with the posters

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Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
				recovery of animal by-products (ETSA). Round-table with the case-study presenters. Questions debated include biobased products opportunities and challenges, perspective of how to turn research into business case, skills necessary to make bioeconomy happen.	
17/04/2023	20	Businesses Academia	In person	Presentation of LIPOR biowaste treatment concept and discussion of possible adaptations and alternatives. Discussion about the feasibility of implementing applications that are being researched to real waste treatment scenario (ex. Additives for anaerobic digestion).	Compost is by far the most known biobased product The more interesting applications for biobased products are energy/biofuels and fertilizers. The biggest barriers for biobased products are education/behaviour and price/cost.

The focus of upcoming BCMs in Greater Porto will again be on biobased products – more specifically, their introduction and acceptance by the public. A special focus will be placed on looking more closely at the barriers as well as driving factors for behaviour change and a shift towards consumption of such products.

Also, will upcoming Biowaste Club Meetings in Greater Porto focus further on sharing learnings with and connecting to other Portuguese cities and regions, hence fostering national uptake and replication of promising practices that were developed in Greater Porto and in the HOOP project.

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3.8. Western Macedonia

Similar to the case of Albano Laziale, the region of Western Macedonia and the city of Kozani are a pilot city in the mother project SCALIBUR. During the four years of SCALIBUR's duration, a number of Biowaste Club Meetings have been held in Kozani, engaging stakeholders from different stages of the biowaste value chain. As a direct outcome of the discussions and exchanges that took place in the Biowaste Club Meetings several pilot activities have been designed and implemented. These include the development and installation of sensors on bins to optimize the collection routes and the expansion of the separate collection of biowaste from open markets to increase and improve the organic fraction collected. As the duration of the HOOP and SCALIBUR project overlapped for two years, the SCALIBUR Biowaste Clubs run during that time were already linked to the HOOP project.

The Biowaste Club Meetings that are organized in Western Macedonia in HOOP aim to build on the work and engagement that has already been initiated in the SCALIBUR project. In this light, local project partners together with the local stakeholders have already discussed and identified pathways to engage HoReCa actors more actively in the city's efforts towards valorizing biowaste. More specifically, in the first HOOP Biowaste Club Meeting in Western Macedonia, the participants discussed the opportunities that lie in the valorization of spent coffee grounds from HoReCa activities. The successive meeting focused on further detailing the action plan for the rollout of the activity, as well as engaging more HoReCa actors to ensure their participation in the activity.

In 2022, the Biowaste Club Meeting on 6 June 2022 was part of a larger event, namely the "Climate Neutral Week" in Kozani, that took place 30 May to 6 June 2022. Kozani is aiming at reaching climate neutrality by 2030 and so the Climate Neutral Week presented an opportunity for local, regional and national stakeholders to come together and exchange on how climate neutrality can be achieved in different sectors (waste management, energy efficiency, smart mobility and sustainable tourism). A total of six hybrid events was organized focusing on the barriers and opportunities posed by the transition to climate neutrality. Best practices from the areas of waste management, smart mobility, clean energy, digital transformation, sustainable tourism, and waste valorisation from the agricultural sector were presented in order for them to be replicated and scaled up on the national level. The case of Kozani was featured as a leading city in Greece in topics of waste and wastewater management. Furthermore, a special event was hosted under this week, focusing primarily on financial tools available for achieving climate neutrality. Local and regional stakeholders were presented with different opportunities on the regional, national and European level for financing the green transition in Kozani and also the benefits and investment opportunities by the development of business parks in the region of Western Macedonia. On the topic of biowaste valorisation, the economic potential and the financing opportunities for urban circular bioeconomy projects were discussed. HOOP partner RdA presented on European funding and financing opportunities. The last two days of the Climate Neutral Week aimed at raising awareness among citizens and instigating their active participation in the city's circular waste management efforts. These activities included "reduce- reuse- recycle" DIY workshops, an exhibition of circular products, a story-telling session to introduce children to the concepts of circular economy and its key principles, as well as games and interactive learn through play activities on proper waste sorting addressing children of all ages.

The next Biowaste Club meeting in September 2022 was a follow-up of the Climate Neutral Week. It was a follow-up activity with the local champions where they could interact with citizens. The overall aim was for them to discuss together the joint vision for climate neutrality in Western Macedonia. Citizens discussed ways to integrate their 'Refuse, reuse, reduce, recycle' model in their everyday lives on a neighbourhood level. Some of these ideas were taken up as activities under Task 6.4 as a series of events organised in Western Macedonia.

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The most recent Biowaste Club meeting was held in October 2022. This meeting signaled the close of the SCALIBUR project. The main achievements and learnings were presented to the stakeholders. Stakeholders identified the hotspots that the HOOP project should particularly focus on.

Table 9. Overview of Biowaste Club meetings in Western Macedonia

Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
30/6/2021	15	Businesses Government – local authorities Academia	Hybrid	Introduction to HOOP, transition from SCALIBUR	Need for active engagement strategies for HoReCa actors to participate in the separate collection of spent coffee ground scheme.
23/9/2021	7	Businesses	In person	Collection of coffee residues from the HoReCa sector	Development of an action plan for rolling out the pilot activity (necessary quantities, location of bins, frequency of collection).
6/6/2022	10	Businesses	In person	Collection of coffee residues from the HoReCa sector	Collection of data from participating businesses and recruitment of new businesses in the separate collection scheme.
26/9/2022	20	Government – local authorities Businesses Citizens	Online	Co-designing bottom-up circular ideas for Western Macedonia	Ideas for potential engagement activities to raise awareness in Kozani and solutions on the ground

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Date	No. of stakeholders	Types of Stakeholders	Format	Focus	Main conclusions
26/10/2022	11	Government – local authorities Businesses Academia	In person	Presentation of final results of SCALIBUR	Most impactful achievements; learnings; ways forward and upscaling opportunities through HOOP
11/2023 **(foreseen, TBD)**	10+	Government – local authorities Businesses	In person	Presentation of results of pilot on spent coffee grounds collection and citizen science app	TBD

Past Biowaste Club Meetings had identified as key focus points the integration of spent coffee grounds stream in the separate collection scheme. The waste management company DIADYMA together with CluBE have collected all necessary data from actors and businesses that have expressed an interest in participating in the activity (i.e. quantities produced, purity of fraction, etc.) and started a pilot activity in collection of spent coffee grounds with electric vehicles. Currently (August 2023), the first collected grounds are in the lab to assess their valorisation potential. In November 2023, CluBE will organize a BCM in Kozani in order to present the first results of the spent coffee grounds collection on the Western Macedonia Region as well as the results from the citizens science app. The stakeholders that will be invited will be the HoReCa representatives and representatives of the Municipalities, the Region of Western Macedonia and other relevant public bodies.

Finally, citizen engagement activities and campaigns – another hotspot identified – have been ongoing in the past months. Specifically, CluBE has been working closely with students in the Western Macedonia region. The Region of Western Macedonia was one of the Lighthouses that introduced the HOOP citizen science app (see detailed description on Deliverable 6.4). The application was launched in January 2023 until May 2023 just before the celebration of the World Environment Day. All the participants, after using the app, participated in a lottery and 5 of the contestants gained biobased and zero waste products such as coffee cups and zero waste soap. After, having the results from the app, SfC implemented 2 workshops promoting the results of the app and future actions about biobased products acceptance, the proper collection of the biowastes and other ideas of upcycling.

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4. Conclusion

This report lined out the progress of the engagement activities through Biowaste Clubs during the period October 2020 to September 2023 in the HOOP Lighthouses. In the Biowaste Club meetings, stakeholders engaged represented, for instance, non-governmental organizations, research and development organizations, business (medium- to small-scale): SMEs and/or local business owners, local public bodies (e.g. city council or municipality) and service providers with a focus on waste e.g. waste collectors, treatment plants, waste management. Subsequent Biowaste Club meetings will be based on the discussion results of the meetings carried out in the reporting period, the tailor-made stakeholder engagement plan for each LH, or will be planned to involve other stakeholders, such as members of the HOOP Network, that are considered to be essential to ensure HOOP leverage.

There were several main challenges when organizing and running BCMs in the eight Lighthouses. The main learnings were the following:

- Many citizens seem to be unfamiliar with the concept of circular economy and therefore cannot connect with it or feel the relevance of circular economy to facets of their everyday lives. This widens the intention-action gap and requires the HOOP project and other circular economy initiatives and experts to translate complex or academic terminology into accessible language. In addition, it helps to provide concrete examples of actions to help citizens better understand how they can contribute.
- Stakeholders are now used to remote meetings and may prefer them due to the lower effort investment. Therefore, depending on the focus of the event, a hybrid format might be crucial for participation rate.
- The stakeholders identified as relevant and important to the BCM focus sometimes have limited time or financial resources to participate despite being motivated and interested to engage.
- In some cases, especially the initial approach, the focus was broad and did not include specific enough action points. Without clear objectives, the stakeholders did not see an added value of the BC to their work or their organization and therefore did not actively engage further.
- To agree on more concrete objectives with the stakeholders, both the citizen science activities as well as the pilot actions helped largely to choose and focus on specific challenges and topics along the biowaste value chain and implement concrete actions along them.

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