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Report on the one-on-one capacity building

Author(s): ACR+

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Author(s)	Jean-Benoît Bel, Serena Lisai (ACR+)
Reviewer(s)	Miguel Ángel Suárez (CETENMA), Sara Bedin (SBE)
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List of acronyms

Acronym	Description
AI	Artificial Intelligence
BC	Biowaste Club
CAS	Czech Academy of Science
CVO	Central de Valorização Orgânica (organic valorisation central)
HORECA	Hotels Restaurants Caterers
IPR	Intellectual Property Rights
LH	Lighthouse Cities and Regions
MTU	Munster Technological University (Ireland)
OFMSW	Organic Fraction Municipal Solid Waste
PAYT	Pay As You Throw
PDA	Project Development Assistance
PHA	Polyhydroxyalkanoates
PML	Project Maturity Level
RMC	Raw Materials Collective
UCBH	Urban Circular Bioeconomy Hub
UCO	Used Cooking Oils
WWTP	Wastewater Treatment Plant

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1. Executive summary

The HOOP project aims to facilitate the transition towards a circular urban bioeconomy by supporting cities and regions in developing sustainable strategies for the management and valorisation of biowaste and wastewater. Through a combination of structured capacity-building initiatives, technical assistance, and peer-to-peer learning activities, HOOP has provided opportunities for knowledge exchange and collaboration among local authorities, technical experts, and stakeholders from across Europe.

This report outlines the key activities and outcomes of the one-on-one capacity-building efforts implemented within the HOOP Network of Cities and Regions. These activities were designed to address the specific challenges faced by HOOP Members and included targeted discussions, study visits, and personalised technical support. The objective was to ensure that cities and regions had access to the necessary expertise and project results to implement effective bioeconomy solutions in their local contexts.

One of the core components of the capacity-building activities has been the HOOP Lunch Talks, a series of thematic webinars that provided Members with insights into technical, financial, and regulatory aspects of biowaste management. These sessions facilitated quick dissemination of more concrete findings from the HOOP projects, as well as exchanges between practitioners and experts, allowing participants to learn from successful case studies and innovative approaches developed within and beyond HOOP.

Additionally, study visits to various HOOP Lighthouse and Members of the Network offered a hands-on learning experience, enabling participants to observe best practices in action. These visits did not only provide valuable technical insights but also fostered relationships among cities and regions facing similar challenges. The in-person interactions proved to be instrumental in strengthening cooperation and facilitating the replication of successful models in different urban contexts.

Technical support was another key aspect of the capacity-building strategy, providing tailored assistance to cities seeking to enhance their waste management systems. While initial engagement with the formal request system was limited, direct interactions during events and study visits proved to be more effective in connecting cities with relevant expertise.

The findings from these activities highlight the importance of flexible and responsive capacity-building approaches. The combination of digital engagement, study visits, and direct technical assistance created a comprehensive framework that not only supported knowledge transfer but also strengthened the network and fostered collaboration among HOOP Members.

As the project moves to an end, sustaining the momentum of these capacity-building efforts will be crucial for ensuring long-term impact. Continued engagement through peer-to-peer exchanges, extended technical support, and the integration of HOOP methodologies into policy frameworks will be essential to furthering the adoption of circular bioeconomy principles in European cities and regions. By building on the successes of these initiatives, HOOP's experience can contribute to the broader objective of creating resilient and resource-efficient urban environments.

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2. Introduction

Local waste and wastewater strategies are strongly shaped and impacted by the local context, which includes local challenges or opportunities linked with the legal/economic framework, weather conditions, typology of housings, or presence of specific target audiences, which can foster or prevent the implementation of common good practices. Therefore, unlocking the potential of local circular bioeconomy can only be achieved if tailored solutions are adopted to tackle these local challenges. This means that cities and regions can greatly benefit from direct interactions and exchanges with experts aware of these specific solutions, for instance other local authorities facing the same local contexts.

To do so, the HOOP Network of Cities and Regions has worked on different ways to facilitate the transfer of good practices and their replication: identification of key topics of interest for local and regional authorities, definition of contextual parameters to help with the identification of common challenges, and feedback gathering mechanisms to understand the actual needs of HOOP Members.

Members of the HOOP Network have been engaged in several activities – online and in presence – to facilitate the discussions among territories sharing similarities and common constrains, but also to share inspiration and practical solutions. The full involvement of the HOOP technical partners has been key to providing the relevant expertise to reply to HOOP members' needs. To ensure that the replication activities were not limited to general guidance but also included activities addressing more specific challenges, a focus was also put on one-on-one, direct interactions that allow different people to meet, exchange, and share knowledge.

Part of these activities were already defined in the HOOP Grant Agreement, but in general, the HOOP Network managers tried to come up with new activities, depending on the expressions of interest of HOOP Members, their responses to the organized activities, or the opportunities arising from the project.

This report provides an extensive description of the activities implemented and of the main conclusions regarding the impact that each process managed to reach within the project lifetime. The one-on-one activities can be divided into the following categories:

- *Identification of interests for the HOOP Members*
- *HOOP Lunch Talks*
- *Presential meetings and study visits*
- *Technical support: some HOOP Members requested more precise input from technical partners, and they were encouraged to fill the HOOP Circularity Label to request further technical support within the 6-month extension period.*

The following chapters will describe the activities for each category, the stakeholders involved and the related outcomes.

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3. Definition of interests

This section aims to explain how information was collected on the expectations and needs of HOOP Members to propose more targeted topics in the replication activities, and to foster exchanges among HOOP partners and HOOP Members. This process proved to be essential to ensure the relevancy of these activities.

Since its launch, the HOOP Hub was used to identify the specific interests and needs of the HOOP members. Once registered, cities and regions could indicate their interests from the following list of topics related to HOOP's objectives and activities:

- *Behaviour change*
- *Circular business models*
- *Circular strategies*
- *Citizen awareness*
- *Citizen science*
- *Collection*
- *Consumer acceptance*
- *Financing*
- *Households*
- *Incentives*
- *Innovation procurement*
- *Investment*
- *Legislation*
- *OFMSW*
- *Pilot projects*
- *Pretreatment*
- *Sorting*
- *Stakeholder engagement*
- *Urban metabolism*
- *Valorisation technologies*
- *Wastewater*

This has been an interesting first step to better understand the needs of members. This information has also been used to plan targeted communication activities with members, to match cities with learning and financing opportunities, and to connect members among each other and with technical partners. Furthermore, when accessing the Hub, members could have immediately an overview of the news and events related to the interests they selected.

Out of 127 members, 45 included some information about their territory in the Hub and selected some topics of interest. Figure 1 shows the number of times that a specific topic has been indicated by HOOP members.

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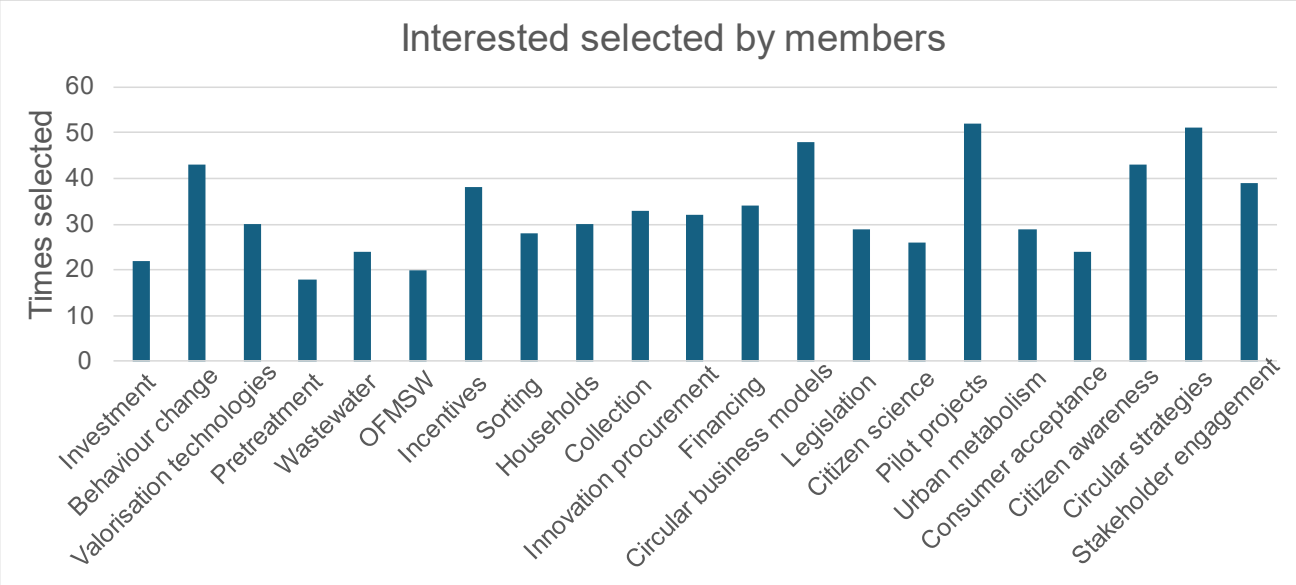

Figure 1. Number of times that a specific topic of interest has been selected by HOOP members

However, the experience of the HOOP Hub proved that such a tool is not sufficient to get a clear idea of the interests and needs of cities and regions. The percentage of HOOP members that filled their profile in the Hub is 35% but, in many cases, the information provided is very limited. Additionally, the Hub has not been used to exchange messages and information between HOOP members and Lighthouses. In fact, only 27 messages have been registered. More generally, it seems challenging to get an active participation on such online platform. In order to address this limit, additional feedback-gathering mechanisms have been adopted.

Surveys proved to be an effective way to collect input from HOOP Members. Specific questions on topics of interest have been included in the registration forms of events (study visits in Bergen and Porto, and for the HOOP Cities and Policy Conference).

This feedback helped to identify key topics to investigate, for instance during the HOOP Lunch Talks or during a study visit. Furthermore, this has been a valuable source of knowledge to build connections among members and HOOP partners and invite them to specific activities.

The first survey was sent in June 2023 and aimed at guiding the design of the HOOP Guidelines for local and regional authorities (published in March 2024). Members have been asked to provide their feedback on topics and formats that would make the HOOP Guidelines more relevant to them. The questions of the survey were based on the first proposed outlines: respondents were asked to assess the relevancy of each of the proposed sections, and then select or propose relevant content. Few questions were also asked on the desired format and how the guidelines could be promoted. Feedback was received from 28 anonymous participants, all Members of the HOOP Network (out of about 70 registered HOOP Members at the time when the survey was conducted). This represented about 35% of the HOOP Members at that time.

In terms of topics of interest, HOOP Members have been asked to evaluate a list of potential sections to be investigated and analysed in the guidelines. The topic focusing on the prevention and collection of biowaste, and citizens' engagement, is the one that gathered the most positive feedback. Three topics received slightly

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lower positive feedback: how to assess the local situation, how to engage local stakeholders, and how to identify and implement valorisation routes, with more respondents stating that they already knew about them. Two topics were labelled as “less relevant” by respondents: the one on investment and business models, and the one on monitoring. No details were asked to respondents on the reasons behind these replies; it is possible that they are not concerned by the investment in valorisation routes (e.g. they are only in charge of collection, or valorisation routes might be under the responsibility of the private sector).

A more detailed description of the survey is provided in the annex to the HOOP Guidelines.

In May 2024, in preparation for the HOOP Cities and Policy Conference, several strategic questions have been integrated into the registration form. All the participants have been asked to provide a preference among the event’s key topics:

- *Technologies available for biowaste valorisation*
- *Business models for biocircular systems*
- *Investments and funding mechanisms for bioeconomy strategies*
- *Procurement of innovation for biowaste valorisation*
- *Stakeholders’ engagement*

Looking at the selection of HOOP Members and considering that they could select up to 2 topics, the results show that the most voted have been business models (24%) and investments and funding mechanisms (23%). The least selected topic was procurement of innovation for biowaste valorisation (13%).

A second form targeted only HOOP members to gather practical information about their participation in the conference. Furthermore, the form included the question: “If you have specific questions/topics that you would like to be addressed during the Conference, or during a specific Parallel session (on 5th afternoon), please describe them here.”. The answers were:

- *How can the quality of biowaste collected be improved at source, especially in high blocks of flats with many apartments?*
- *Do they have concrete examples of public procurement of bioproducts, and what criteria was used in the tender process? if yes, is there information about how effective those solutions were compared to the non-biobased products?*
- *Tools for measuring circularity for cities and regions*
- *Do other members or regions have problems with biowaste contamination (collection system) namely plastic bags. And are plastic bags a problem for biowaste management.*
- *What are the solutions for collecting door to door biowaste in multifamily buildings?*
- *How is the population's adherence?*
- *What tools do other regions have when the population does not separate biowaste?*

The topics have been addressed during the conference. In particular for door-to-door collection in multifamily buildings, a thematic discussion has been organised in the study visit in Bergen, matchmaking Lighthouses and HOOP members interested on the topic, also following the results of another collection of feedback.

Members that registered for the study visit in Bergen have been asked to provide a list of topics they would have liked to discuss with HOOP Lighthouses and partners. The results are listed below:

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- *Collection in apartment*
- *Collection in bring points*
- *Quality control with bring points*
- *Communication on sorting instructions*
- *Waste management in busy areas*
- *Citizen involvement*
- *Information to the public*
- *Home composting*
- *Community composting*
- *Door-to-door collection of HORECA*
- *Use of end-products*
- *Managing green waste from the city and seasonal variations*
- *Recycling of WWTP sludge*
- *Effective collection system*
- *Supporting cities with "wise investments": improving the service without compromising the economic balance*

These results led to the organisation of three discussion groups during the HOOP meeting in Bergen, allowing the identification of more specific interests from the HOOP Members. It guided the identification of replication activities to be organised in the 6-month extension of the HOOP project, such as the two study visits in Florence and Porto.

During the last Study Visit organised in Porto in January 2025, representatives of 18 HOOP members have been invited to share their main interests when it comes to biowaste management and local circular bioeconomy, to guide the presenters and foster one-to-one exchanges among participants sharing the same interests. The following topics have been listed:

- *Efficient biowaste management system for rural areas*
- *Citizens' engagement, especially considering the rapid change of population due to migration*
- *Biowaste collection and treatment*
- *Support for decentralized composting community (also connected to regulation)*
- *Forestry biowaste management and recovery*
- *Economic incentives to foster soring among inhabitants*
- *Reduction of biowaste management costs (and fees)*
- *Improvement of the quality of collected bio-waste*

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4. HOOP Lunch Talks

To facilitate the constant and mutual exchange between Network members, Lighthouses and partners, a series of webinars have been organised each last Thursday of the month. The HOOP Lunch Talks have been only open to HOOP partners and members of the HOOP Network. Each episode saw a presentation and discussion on a key topic during a 30-45-minutes session. Each episode registered between 15 and 20 participants live. The format was defined in a way to foster the one-on-one approach sought by the HOOP replication strategy: a single intervention on a specific topic that can foster exchanges among HOOP Members.

Divided into 3 seasons, the series has been composed of a total of 22 episodes, listed in the Table 1.

Table 1. List of episodes of HOOP Lunch talks

Date	Title	Speaker
31/03/2022	HOOP Technologies to foster bioeconomy in your city: the episode focused on the technologies that the 8 HOOP Lighthouse cities and regions were developing with the goal to recover valuable resources from biowaste to make bio-based products. Collection strategies, bio-products to feed animals, revalorisation of the residues produced in a composting plant, valorisation of streams from biogas production, high-value products from urban wastewater sludge, and also valorisation of coffee grounds and used cooking oil have been presented.	CETENMA
28/04/2022	Engaging citizens in food waste collection: the episode focused on how to actively involve and commit citizens in food waste collection. BIR, the company managing municipal waste of the HOOP Lighthouse City Bergen in Norway, promotes citizen awareness and engagement in circular economy, leading to significant improvements in waste separation.	BIR AS (Lighthouse Bergen)
26/05/2022	The investor perspective of urban circular bioeconomy projects: the episode focused on how investors and financiers address the development of urban circular bioeconomy projects, namely considering risk profile and EU Taxonomy requirements. It shared the "investor perspective" of circular economy finance when it comes to risk profiling, due diligence and ESG commitments.	RdA Climate Solutions

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Date	Title	Speaker
30/06/2022	Circular Business Models applied in the value chain of biowaste valorisation: the episode focused on the four-level methodological approach that HOOP Partner DRAXIS has applied to develop a new integrated Circular Business Model typology focused on bio-waste.	Draxis
29/09/2022	Bio-waste, a global problem requiring an integrated approach: the episode focused on one of the HOOP Lighthouse cities: Porto. Participants could hear more about LIPOR's circular approach for biowaste and the strategies they have developed.	LIPOR (Lighthouse Porto)
27/10/2022	4 key recommendations for local and regional authorities to stop food waste: the episode focused on how local and regional authorities can prevent food waste in households. Participants were guided through the report ACR+ published regarding practices and strategies for which food waste reduction was monitored and documented.	ACR+
01/12/2022	The HOOP network becomes Virtual through the UCBH: the episode focused on how the Network can be involved in the HOOP Urban Circular Bioeconomy Hub. Through a tutorial session, members and partners were guided to discover all the functionalities of the Hub, which has been designed to facilitate the interaction among cities and regions and to foster the knowledge exchange on bioeconomy strategies and technologies.	ACR+
26/01/2023	The HOOP Circularity Label – What is the level of bio-circularity of your city? The episode focused on the HOOP Bio-Circularity Label. This tool aimed at playing an important role in the mission of supporting cities and regions to boost their circular urban bioeconomy. The members of the Network could learn its functionalities to understand to what extent cities and regions implement circular measures, policies, and initiatives.	BaxCo
23/02/2023	Biochar – Moving carbon back to soil: the episode focused on biochar as soil conditioner. There is growing interest in it and in pyrolysis as an alternative for biowaste treatment. The speakers explained more about biochar, pyrolysis and the experiences from Münster.	CETENMA and AWM (Lighthouse Münster)

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Date	Title	Speaker
30/03/2023	How to bring stakeholders together? the episode focused on Bio-waste Clubs and how they brought stakeholders together. CSCP guided participants to understand how local and regional stake-holders can be engaged to develop a common vision and actions for circular biowaste and the main challenges and benefits coming from the HOOP cases.	CSCP
27/04/2023	Innovative reuse of the central landfill site Leppe: the episode fo-cused on the case of the central landfill Leppe in Lindlar, Ger-many, that was reused in an innovative way. BAV, the local public waste management association and HOOP member, explained how the :metabolon project transformed the former Leppe landfill into a competence, learning and innovation site for circular econ-omy.	HOOP member BAV
25/05/2023	Biobased Products Acceptance: How to make children hear you: the episode focused on strategies to promote the biobased-prod-ucts acceptance implemented by CluBE in the HOOP Lighthouse Western Macedonia. CluBE has great experience in citizens en-gagement for promoting recycling, upcycling and biobased prod-ucts acceptance. Their main goal is to promote Behavioural Change on citizens through the organisation of regular school vis-its. Several games focused on reduction, recycling, sorting and reusing but especially on biobased products, which are used as creative tools to raise awareness among children on seeing waste as a resource.	CluBE (Lighthouse Western Macedonia)
29/06/2023	Fostering wastewater valorisation through nitrogen recovery: the episode focused on nitrogen recovery from wastewater as a cru-cial aspect of nutrient circularity. It plays a significant role in pro-moting sustainability and resource efficiency. Wastewater, partic-ularly municipal and industrial wastewater, contains various forms of nitrogen, mainly ammonia and nitrate. CETAQUA explained how implementing nitrogen recovery technologies in wastewater treatment processes can reduce the discharge of nitrogen-rich ef-fluents into the environment, minimize eutrophication of water bodies, and recover valuable nitrogen resources for beneficial re-use, such as fertilisers.	CETAQUA
28/09/2023	HOOP Trainers: neighbours shape circular bioeconomy playing and debating: the episode focused on how gamification can help to reflect on circular economy and create bioproducts. HOOP partner Science for Change unveiled the exciting Citizen Science	Science for Change

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Date	Title	Speaker
	initiatives within HOOP, which aims at training citizens with the avatar Dubiop in the art of transforming organic waste into valuable bioproducts and have transformed the data gathered in the game into valuable improvement proposals for optimising the separate collection of OFMSW.	
26/10/2023	From the new composting plant to the Reuse Centre in Albano Laziale: the episode focused on the experience of the HOOP Lighthouse Albano Laziale. They have improved the separate collection of municipal waste through the implementation of a series of measures in different aspects of the waste management system: raising public awareness; investing in strategic infrastructure; introducing financial incentives to ensure the maximum increase in separate waste collection; and collaborating with waste management companies, local authorities and other stakeholders to implement innovative solutions. This brought to a progressively improvement over time of the differentiated collection of urban waste, obtaining a quality of the organic fraction of around 98%, according to the analysis carried out every six months.	Lighthouse Albano Laziale
30/11/2023	Best practices from Almere: the Raw Material Collective: the episode focused on the Raw Material Collective (RMC) and several best practices implemented by HOOP Lighthouse Almere. RMC focuses on process and product development and makes the first steps of transforming raw materials in new products. It is a partnership of companies, governments and knowledge institutions that process urban waste streams into new raw materials for products and applications. By initiating and realising projects in this field, the RMC aims to contribute to the development, production and market readiness of these new raw materials and products.	Raw Materials Collective (Lighthouse Almere)
25/01/2024	The HOOP Circularity Label: the episode focused on the HOOP Bio-Circularity Label, which aims to play an important role in the mission to support cities and regions to boost their circular urban bioeconomy. The label has been developed to show to what extent cities and regions implement circular measures, policies, and initiatives, and how they can improve their performances by implementing specific circular measures. HOOP members have been guided through the process to obtain specific recommendations to improve the level of bio-circularity of their territory.	BaxCo

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Date	Title	Speaker
29/02/2024	Tools to empower financial investments: the episode focused on the several tools developed within HOOP to improve the maturity and bankability of circular bioeconomy investment projects. Such tools (e.g., due diligence, financial model, PML calculator) are important to mobilise green financing and funding, and to make the projects more financially attractive.	RdA Climate Solutions
28/03/2024	Leveraging IPRs when procuring innovation: the episode provided examples and recommendations to assure reasonable interests of public buyers to reduce the procurement cost and to ensure that incentives for enterprises to innovate are not distorted and that access to markets is not foreclosed, analysing relevant IPR legal framework in Europe. Public procurement of research and development services and/or innovative goods or services may lead to the generation of new intellectual property rights (e.g. patents or copyrights, design rights, trademarks). In procurement competitions that do not specifically aim to buy innovative products or services, a contractor may also propose an innovation during contract implementation. Defining clear IPRs allocation clauses in the tender documents is thus important for all public procurement.	Sara Bedin
25/04/2024	Advancing Circular Economy in Kuopio Lighthouse City: the episode focused on the example of Kuopio, a fascinating 124.000 population city of pure nature with lakes and forests, which invests in sustainable technological development. Among the different initiatives, participants could learn about the development steps with pilot actions in biochar pilot reactor and citizen engagement.	Savonia UAS (Lighthouse Kuopio)
30/05/2024	Innovation Public Procurement: Toolbox for getting started: the episode illustrated the instruments (namely pre-commercial public procurement, public procurement of innovative solutions, and innovation partnership) and activities (like performing a needs assessment, market analysis, developing a business case, and preparing tender documents) and key tools for the strategic use of innovation procurement to tackle challenges in circular bioeconomy sector.	Sara Bedin
27/06/2024	Murcia´s Circular Economy Strategy: the episode focused on Murcia's roadmap for urban biowaste. The city has initiated a reflective process to design a shared vision to reach its circular goals for 2030.	Lighthouse Murcia

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4.1. Lessons learned from the HOOP Lunch Talks

Each episode has been a way to disseminate good practices implemented by HOOP Lighthouse, share information about guidelines, tools and services produced by the technical partners but also to activate an exchange among HOOP members. For instance, episode number 7 of the second season focused on the experience of the HOOP member BAV, which presented an innovative project for the reuse of a landfill site.

All the presentations and recordings of the HOOP Lunch Talks have been made available only for the HOOP members through the HOOP Urban Circular Bioeconomy Hub.

To evaluate the level of appreciation of this activity, questions regarding the HOOP Lunch Talks have been included in the surveys mentioned above.

In the survey shared in June 2023 and filled by 28 members, 17 people said that they already knew this service. Among these, 63% followed the episodes live, the others indicated that the reason for not watching it live was the fact that it did not fit with their agenda. Among those that never attended a HOOP Lunch Talk, 8 declared that the main reason was lack of time and 3 lack of human resources. This was a relevant sign that in-person meetings, even if only of 1 day, especially promoted in advance, could be a better way to have the full attention of the Members. In fact, the same survey indicated a strong interest in study visits.

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5. Study Visits

Study visits have been key to facilitating one-on-one interactions between HOOP members, Lighthouses and HOOP partners. In fact, the different in person activities that have been organized strongly encourage active interaction on topics that could support HOOP cities and regions in their local plans and activities. Often, participants in the study visits provided a list of key topics relevant for their local context. On the other hand, formal and informal discussions during the study visits have been often followed by online interactions.

A total of 7 study visits have been organized:

Table 2. List of HOOP study visits

Location	Date	HOOP members involved	Topics of discussion
Münster - Almere	21-22/06/2022	Brussels Region, Kotor, Guimaraes, The Hague	Anaerobic digestion, pyrolysis and biochar, biowaste collection and valorisation of green waste
Porto	24/11/2022	Câmara Municipal de Lisboa, Comunidade Intermunicipal do Alentejo Central, Valorsul	Composting plant; social acceptance of bio-based products
Kuopio	16/06/2023	Ciampino, Kotor, Krakow	Slow pyrolysis
Prague	01/12/2023	COSIR, Sardinia Region, CONOE, Castellamare di Stabia, San Cesareo	Used Cooking Oils fermentation technology
Bergen	11-12/09/2024	Agueda, Amcal, Coimbra, Copenhagen, Egaleo, Florence, Western Regional Council Malta, Niepolomice, Oisterwijk	Biobased products; industrial symbiosis
Florence	27/11/2024	Agueda, Amsterdam, Arezzo, Bodo, Ciampino, Coimbra, Cologno Monzese, Egaleo, FADI, Kalamaria, Maia Ambiente, Northern Regional Council Malta, Porto Ambiente, Povoa de Varzim, Valongo, Vitrus	Biowaste collection in historical centre, HORECA engagement

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Location	Date	HOOP members involved	Topics of discussion
		Ambiente, Volsca, Western Regional Council Malta	
Porto	27-28/01/2025	Amsterdam, Oisterwijk, Guimaraes, Northern Regional Council Malta, Agueda, Alytus, Tâmega e Sousa, Niepolomice, Valongo, Public Utility Company Kotor, Florence, Warsaw, Coimbra, Ciampino, Valorsul, San Lucido, Saaremaa Parish Government, Vico Equense, Avezzano, Zagreb, Vila Nova De Gaia, Crispiano, UAB VAATC.	Biowaste management, bioproduct acceptance, composting plant

An additional study visit is being organised on 26 March 2025 in Murcia together with the final event of the HOOP project. 20 representatives of 15 HOOP members (Tingvoll, Warsaw, Vico Equense, Valongo, Niepolomice, Oisterwijk, Northern Regional Council Malta, Ciampino, Kotor, Coimbra Region, 2 cities from Western Regional Council Malta, Diadyma, Soure, Copenhagen, Alytus) will join this last project activity. This will be the opportunity for HOOP members to reinforce the connection with technical partners and to share their achievements and lessons learned.

5.1. Study Tour Münster – Almere

HOOP hosted its first 'Study Tour' on 21 and 22 June 2022, visiting the Lighthouse Cities of Almere and Münster to learn more about their management of biowaste and wastewater. Münster has been separately collecting and managing biowaste since the 1990s so have lots of experience to share. The local waste management company Abfallwirtschaftsbetriebe Münster (AWM) gave a guided tour of their biowaste management facilities, in particular their anaerobic digestion plant, among the first in Europe. Almere is a young city with big sustainability ambitions. This part of the visit focused on their innovative pilot projects to transform aquatic plants into paper and other bio-based products. Furthermore, participants were guided in the city's recycling centre and could see the process for the production of green concrete. The study inspired innovative solutions that HOOP Network members can adapt and implement in their own territories. It also provided opportunities for HOOP Network Members and HOOP Lighthouses to share their own experience and identify rooms for collaboration.

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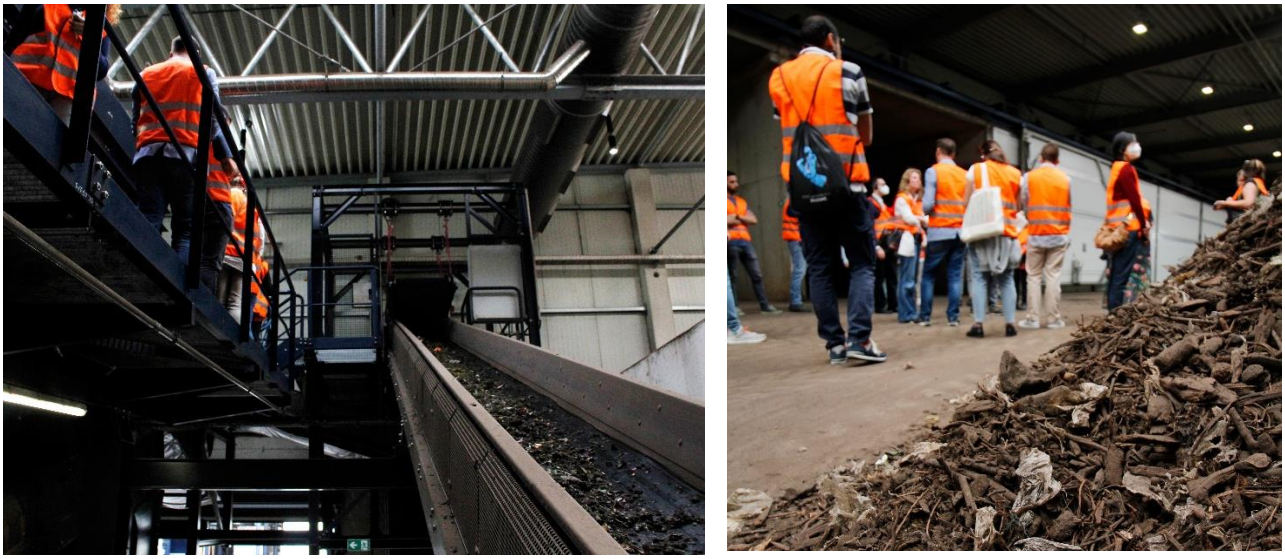

Figure 2. **Visit of AWM Biowaste-Management facilities (Münster)**

Figure 3. **Visit of the recycling centre, in particular of the green concrete (Almere)**

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Table 3. Agenda of study visit Münster-Almere | June 2022

21 June 2022		
Time	**Location**	**Description**
8:00	Münster	Münster vision and its role in HOOP
9:30	Disposal Centre Münster	Guided Tour around the AWM Biowaste-Management facilities. Presentations included organic waste sorting, anaerobic digestion of the organic fraction and, finally, digestate composting (Figure 2). Walk to the Composting Area following the “Landfill-Learning Trail” along different learning stations conveying the guiding principles of a modern and resource-conserving circular economy. Guided Tour around the Green Waste Composting facility to present AWM's approaches to producing quality-sealed compost from green waste.
13:00		Lunch break
14:30	Biologic station “Der Rieselfeldhof”	“Aktion Biotonne Münster”: waste advice programme for refugees
22 June 2022		
9:00	Almere	Almere’s vision for local bioeconomy and its involvement in HOOP
10:45	Recycling Centre Cirwinn	Visit of the recycling centre, in particular of the process to produce green concrete (Figure 3).
12:00	Floriade	Visit of the Dutch horticultural exposition. The theme of the Expo was "Growing Green Cities", which focuses on the need to combine nature and cities. In the tour, Almere’s team guided the participants to the Circular Bridges built from residual material from old bridges and buildings, bridges and other constructions made from organic material. Presentation on application of biobased products and materials in the construction sector. Almere presented their traffic signs made by using invasive local plants. Circular business models for bio composites and construction materials.

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5.2. Study Visit and Biowaste Club in Porto

The second study visit has been organised by LIPOR, the entity responsible for treating the waste of 1 million inhabitants from 8 municipalities of the Greater Porto area, together with the 3rd HOOP General Assembly. Participants were guided through Lipor's experience and strategy for biowaste management, innovation, and communication and they could visit its Tunnel Composting Plant, its Environmental Education Centre (Horta da Formiga), and its leisure park, created in a former landfill (Parque Aventura). The visit was merged with the Biowaste Club (BC), aiming to involve stakeholders across the biowaste value chain in discussing the topic "Biowaste to bioproducts". Other HOOP partners shared their insights and case studies: CETAQUA, CSCP, AWM (Münster), and Murcia.

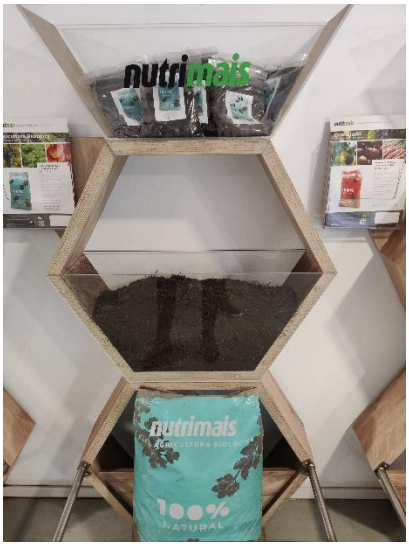

Figure 4. Visit of Lipor's facilities (Porto)

Table 4. Agenda of study visit Porto | November 2022

24 November 2022		
Time	**Location**	**Description**
8:00	Lipor's premises, Porto	Introducing Lipor (Innovation, Biowaste Management and communication Visit to LIPOR facilities: composting plant, Horta da Formiga, Parque Aventura (Figure 4).
13:00		Lunch break
14:30		Biowaste Club: presentations by HOOP partners and cities were followed by a group dynamic where participants discussed on specific biobased products.

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Representatives from different Portuguese municipalities as well as from waste management facilities discussed with HOOP partners on different aspects such as enabling factors, barriers and constraints for the development and commercialisation of different bio-based products.

5.3. Study Visit in Kuopio

HOOP hosted its third Study Visit, merged with the 4th HOOP General Assembly, on 16 June 2023 in the Lighthouse City Kuopio lo learn more about its management of biowaste. Kuopio is an Eastern Finnish city in the middle of the most beautiful Finnish lake, the Lake Kallavesi. The area of the city of Kuopio has about 120,000 inhabitants and the area of North Savo has about 250,000 inhabitants. Since 2001, Jätekukko Ltd is responsible for regional waste management and in 2003 they implemented the separate collection of Organic Fraction of Municipal Solid Waste (OFMSW) and the promotion of home-composting. Separately collected biowaste goes to biogas production, other fractions are recycled for reuse and mixed waste is used for heat production.

Participants could also visit Elävä Säätiö facilties, a hub that was first implemented to recycle textiles but evolved into an integrated innovative system for refurnishing cloths, furniture, big household items, etc. The study visit aimed to 1) inspire innovative solutions that HOOP Network members can adapt and implement in their own territories and 2) to provide opportunities for HOOP Network Members to meet HOOP Lighthouses and Technical Partners and receive feedback or exchange lessons learnt.

Figure 5. Visit of Jätekukko facilities (Kuopio)

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Table 5. Agenda of study visit Kuopio | June 2023

16 June 2023		
Time	**Location**	**Description**
9:00	Savonia University, Kuopio	Kuopio project assisted by HOOP: a pilot facility to uptake slow pyrolysis of different feedstocks. The HOOP Network of cities and regions brought questions and challenges to the Consortium. Each member of the Network presented their own organization and territory highlighting the most innovative solutions in terms of bioeconomy. Each member also raised 1-2 burning questions on how to improve their local bioeconomy strategy. Presentation of Jätekukko waste management system with a focus on the composting system of the region.
11:30		Visit to Jätekukko facilities (Figure 5)
12:30		Lunch break
13:30		Visit to Elävä Säätiö facilties

5.4. Study visit in Prague

On 1 December 2023, 6 members from cities and regions of the HOOP Network had the opportunity to visit the innovative company Nafigate, one of the leading global producers of P3HB biopolymer from biowaste (used cooking oils), in Prague. The meeting took place at the Microbiological Institute of the Czech Academy of Science (CAS)/Nafigate and provided an in-depth insight into the Hydal® biotechnology developed and patented by Nafigate and its financial, economic and scale-up aspects.

The visit spun off from the PDA (Project Development Assistance) service that the lighthouse city of Albano Laziale has received in the frame of the HOOP project and it was co-organised by ANCI Lazio (Association of municipalities of Lazio region, representing this Lighthouse in the HOOP project), HOOP coordinator CETENMA and Nafigate Corp. The scope of this study tour was to dive deeper into the solution for the valorisation of used cooking oils (UCOs) into the bioplastic P3HB that was proposed to Albano Laziale and the other HOOP Lighthouses by the HOOP technical partners. The meeting was also attended by members of the HOOP Network that shown interest in this biotechnology such as the Region of Sardinia, the Municipality of Castellammare di Stabbia and the Municipality of San Cesareo, CONOE (National Consortium for the Collection and Treatment of Used Vegetable and Animal Oils and Fats - Italy) and COSIR (Consorzio Servizi Imprese Riunite a r.l.) for

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them to gather first-hand information. As part of the PDA route for the Albano Laziale Lighthouse, the visit to the Nafigate biotechnological and chemical plant in Prague has been of considerable importance in the light of the innovative biotechnological technologies proposed. In particular, the fruitful dialogue initiated within the PDA on the technology for the fermentation of used cooking oils (UCOs) has attracted the interest of key stakeholders at regional and national levels for the implementation of the novel value chain to produce P3HB (a biocompatible and biodegradable PHA) from UCOs for cosmetics applications.

The technology of interest exploits used oils as a rich source of carbon for bacteria, which use them in their metabolism to synthesize P3HB, a completely biodegradable, non-toxic and biocompatible polyhydroxyalkanoate (PHA). This material finds application in sectors such as cosmetics, biomedicine, packaging, agriculture and 3D printing. A crucial point is that bacteria can produce up to 0.70 kg of PHA from 1 kg of UCO, underlining the exceptional efficiency of this technology. Furthermore, implementing UCO valorisation technology does not require starting separate collection of used oil from scratch, simplifying the process. The environmental implications of this technology are highly significant. It results in the production of a product with high added value, well above what is possible with biofuels, in a constantly growing market sector. This also contributes to reducing the use of fossil fuel-based polymers and virgin plastic, encouraging the adoption of used cooking oils which, when disposed of inappropriately, pose a threat to the environment.

Figure 6. Guided tour of the pilot plant of Nafigate (Prague)

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Table 6. Agenda of study visit Prague-Nafigate | December 2023

1 December 2023		
Time	**Location**	**Description**
10:00	Microbiological Institute Nafigate, Prague	Guided tour of the pilot plant and presentation of UCO technology by Nafigate experts (Figure 6). Discussion on technical details, financial and logistical aspects. Expectations and needs from participants. Discussion of next steps and planning of future actions on "development of Business Model"

5.5. Study Visit in Bergen

The study visit in Bergen has been merged with the 5th General Assembly of the project (Figure 7). This allowed the HOOP members to not only meet and interact with all the HOOP partners, but also to have a view of all the project activities and, in particular, a foretaste of the next steps. A milestone was shared with all the participants: the HOOP project had been extended for 6 months in order to focus on the replication of the project results.

Figure 7. Participants of the study visit in Bergen

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During the first day, participants explored how Lighthouse Cities and Regions are leading the way in turning biowaste into a resource for the circular economy. Each HOOP Lighthouse showcased its innovative approaches to biowaste management, offering actionable lessons for others to replicate. Bax Innovation presentation on how the HOOP tools can be leveraged for long-term success was followed by a collaborative session to ensure they stay relevant and adaptable. Then, following the news of the extension, participants were guided into the replication plan by ACR+, which presented some key additional study visits and activities to be implemented in the next months, based on the needs and interests of the HOOP members.

The afternoon was all focused on good practices with the visits to Bergen's success stories: 1) an industrial symbiosis project supported by HOOP's regulatory assessment and local Biowaste Club and 2) Invertapro AS's demo facilities, seeing first-hand how biowaste is use to feed insects opening to different valorisation routes as food, feed and circular fertilisers, thanks to the support of the HOOP PDA.

The second day deep dived into the biowaste valorisation landscape in Bergen. BIR Bedrift AS and Greentech Innovators guided participants through their impressive journey with HOOP's Project Development Assistance (PDA), exploring how Bergen is leading the way in circular economy innovations. This was followed by a collaborative session to brainstorm what's next for biowaste and green tech development. The next session was moderated by Greentech Innovators that showcased their unique process of turning biowaste into microalgae. The group was then divided in two to tour 1) BIR Bedrift facilities, to witness how waste is received and valorised, and 2) Greentech Innovators' pilot plant, where biowaste is transformed into fermentable broth for algae farming, complemented by BIR Bedrift's Ommat feed lab, turning food waste into feed and food.

Each visit provided a first-hand look at the practical applications of circular economy principles, showing how biowaste can be leveraged for valuable outputs.

Figure 8. Presentations of Greentech Innovators (Bergen)

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Table 7. Study visit Bergen | September 2024

11 September 2024		
Time	**Location**	**Description**
10:00	Voss	The HOOP Lighthouse Cities and Regions' experience HOOP flagship tools: where to find them, why and how to use them, how to keep them alive Replicability plan: good practices, lessons learned and the HOOP tools along the HOOP Network
13:00		Lunch break
13:45		Study visit to Bergen's success cases & Assistance match-making to HOOP Network Members
16:30		Assistance service: participants are divided in groups: - *An effective selective collection system* - *Communication with stakeholders* - *Biowaste valorisation: home composting, green waste and wastewater sludge valorisation*
12 September 2024		
9:30	BIR Bedrift AS premises	The HOOP journey of Bergen's BIR and the PDA to Greentech Innovators From biowaste to microalgae: get to know Greentech Innovators (Figure 8).
10:15		Switching sessions: Visit to BIR Bedrift facilities: waste reception and valorisation Visit to Greentech Innovators pilot plant: from biowaste to fermentable broth for algae farming, and BIR Bedrift's feed lab (Ommat): from food waste to feed and food.

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5.6. Study Visit in Florence

The study visit on bio-waste collection in historical centres has been organised on 27 November 2024 by ACR+ in collaboration with the HOOP Lighthouse Albano Laziale and the HOOP member City of Florence, as part of the replication activities of the 6-month extension of the project. It gathered 30 representatives of 21 members of the HOOP Network of Cities and Regions that could spend together a full day of learning, exchanging, field visits and inspirational talks. This study visit, as the next one, has been planned and organised following a specific request shared by some HOOP members in Bergen, which explains the strong and enthusiastic participation that followed.

Figure 9. Visit of underground container in the centre of Florence (left) and of the biowaste management plant (right)

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Table 8. Agenda of the study visit Florence | November 2024

27 November 2024		
9:00	Florence	Presentation of Albano Laziale' strategy: The experience of Albano Laziale to optimise the biowaste collection and the collaboration with the HORECA sector. Technology applied to waste collection and the role of small municipalities on sustainable waste management. Biowaste valorisation: the experience of Albano Laziale in HOOP.
10:00		Presentation of Circular Florence Strategy: Florence: Waste collection in historical centre. The collaboration with the HORECA sector in Florence: challenges and success factors.
11:30		Field visit of underground containers and the other collection systems implemented in the historical centre (Figure 9).
13:00		Lunch break
15:00		Visit of the new biowaste management plant (composting and anaerobic digestion).

5.7. Study Visit in Porto

The last study visit was organised in collaboration with the FER-PLAY project, in the vibrant city of Porto, Portugal. Hosted by LIPOR and ACR+, this event offered an engaging exploration of biowaste management strategies and innovative circular economy practices. Interactive discussions, including a round table on bioproduct acceptance, and site visits to facilities such as the CVO composting plant and LIPOR's Experimentation Centre, provided valuable learning and networking opportunities.

This study visit not only highlighted sustainable waste management solutions but also fostered collaboration among stakeholders dedicated to advancing circular biowaste economies.

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Table 9. Agenda of the study visit Porto | January 2025

27 January 2025		
14:00	LIPOR's premises	Innovation in Coffee and Green Waste Management: Obtaining High-Value Products LIPOR bio-waste strategy Valorisation of compost refuse into biochar for agriculture uses Managing nutrient excess: from troubles to fertilisers through an open market consultation
15:45		Circular fertilisers acceptance Presentation of the Fer-Play project and guidelines Roundtable
28 January 2025		
9:30	LIPOR's premises	Visit to small scale anaerobic digestion plant (Figure 10) Visit to Green Waste Composting Park Visit to CEL (LIPOR's Experimentation Centre)
13:00		Lunch break
14:30		Visit to community composting site Separate collection in the Historic District (Figure 11)

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Figure 10. Visit of anaerobic digestion plant (Porto)

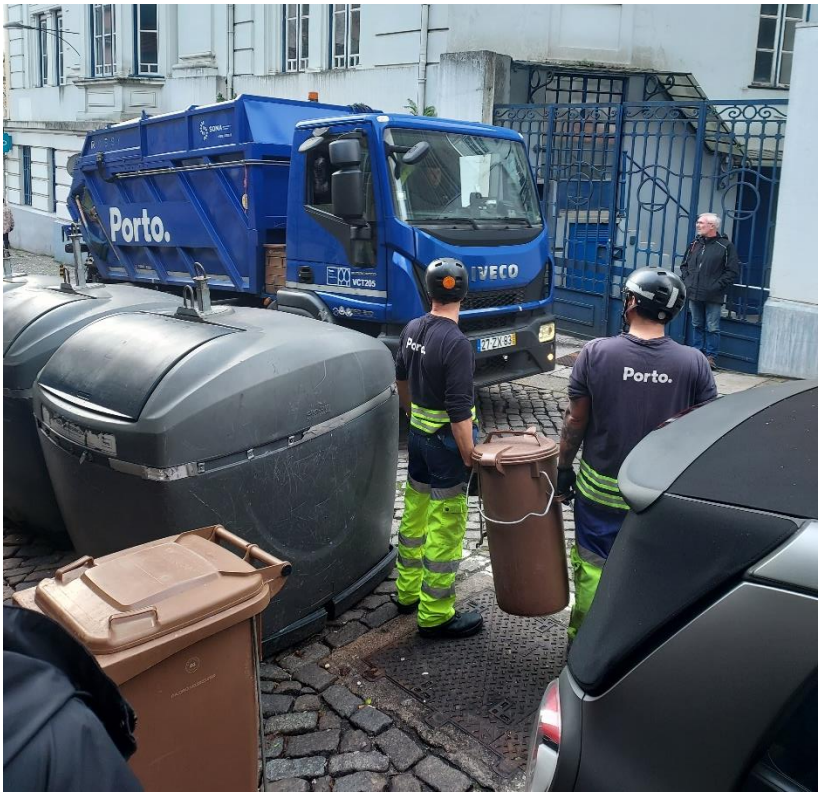

Figure 11. Visit separate biowaste collection in historic centre (Porto)

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The study visit addressed many different specific challenges and solutions relevant to both dense areas (collection in historical centre) and remote areas (small-scale units, community composting). HOOP Members expressed common expectations when it comes to peer learning, such as the general improvement of biowaste management, but their expectations also reflected their own specific challenges related to density, remoteness, specific target audiences, or national regulation. A focus on biowaste-based, circular fertilisers was made possible thanks to the collaboration with the FER-PLAY project, and highlighted the importance of better aligning the biowaste management system with the needs of end-users, especially when it comes to quality, but also to consider them less as waste by-products and more as high added value products to allow their marketing and successful collaboration. Testing and improving the characteristics of circular fertilisers, investing in their marketing, and engaging in discussions with the end-users to better understand their needs and constraints are approaches that are worth replicating to move from biowaste management to local circular bioeconomy.

5.8. Lessons learned from study visits

The in-person meetings had many different positive outcomes when it comes to direct interactions. Study visits generally lead to discussion on more detailed, technical aspects and contribute to make the transfer of good practices more concrete and operational. Moreover, in-person meetings lead to formal and informal exchanges among participants, but also allowed HOOP Network managers and HOOP partners to concretely engage with HOOP Members and identify their specific challenges, who could then be connected to other cities and regions or directed to specific resources.

The HOOP Cities and Regions Conference turned out to be a turning point to the involvement of HOOP Members. The interactive sessions involving a large number of Members seem to foster a core “HOOP community” of active members who were then eager to participate to the next activities. After the HOOP City and Regions conference, HOOP Networking activities received more attention and participation.

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6. Technical support

Since the very first phases of the project, HOOP partners collaborated to include the technical support among the services available for members. All the technical partners have been involved in this activity and offered their time to organise one-on-one meetings with the interested HOOP members. It was possible to access to this service by filling a form available in the HOOP Hub. Only HOOP members of the Network could have access to this service.

This tool was used only twice. Once by the HOOP Lighthouse Münster, which sent a request on good practices from waste management companies that established a hierarchy in the collection teams. They are planning to divide the waste disposal into teams with defined team leaders, who would support in improving the information flow within waste collection teams.

This request was published to be addressed in the Forum available on the Hub.

The second request arrived from BIR, representing the HOOP Lighthouse Bergen, which requested information on AWM's (Münster) ongoing manual biowaste impurity controls (Aktion Biotonne Münster) and planned activities in connection with artificial intelligence for the impurity detection before collection. To this, a bilateral meeting between AWM and BIR followed.

Although the frequent promotion of this service among the members, the form available on the Hub did not work. For this reason, ACR+ pushed for more for direct communication with the Members, especially during in-presence study visits and online meetings (HOOP Lunch Talks). In fact, a series of one-on-one interactions have been conducted thanks to the participation of members in other HOOP activities. Besides, it turned out that HOOP Members tended to prefer emailing directly HOOP Managers to ask more specific questions or request assistance, despite the fact that the form and technical support system was promoted at several occasions during in-person meetings.

Table 10. List of interactions conducted in terms of technical support

Date	HOOP member	HOOP partner	Interaction
December 2021 – March 2022	Volsca, DIADYMA SA	Sara Bedin	Support in the preparation of a cross-border and joint innovation procurement design for the valorisation of spent coffee grounds. The HOOP expert offered her vision on the partnership model, and the concession versus the competitive procurement model. Additionally, the HOOP expert worked to search for the funding source, validate the eligibility

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Date	HOOP member	HOOP partner	Interaction
			criteria and prepare the project description for submission(s).
October 2022	Brussels Environment	AWM (Lighthouse Münster)	After the study visit in Münster, Brussels Environment expressed interest in the trainings organised for foreigners on waste sorting by AWM. Links and material have been shared.
2022 - 2023	South West Ireland	CETENMA and Biomass Research	HOOP partners were invited to give a lecture at the Circular economy class at MTU 3 times.
June 2023	Bergischer Abfall-wirtschaftsverband (BAV)	AWM (Lighthouse Münster), CSCP	Study visit of *:metabolon*, a former landfill that was converted to a competence centre for circular economy and resource management with a strong focus on education and research.
July 2023	USK Kleve AöR	AWM (Lighthouse Münster)	Several calls were organised leading to a visit to the sewage sludge pyrolysis plant in Kleve-Salmorth. There have been several exchanges (calls and online meetings) on various topics. These included, for example, Kleve's experiences regarding the costs and benefits of an identification system in conjunction with AI-based contaminant detection in biowaste collection, Münster's experiences in collecting recyclable waste bins and an exchange of experiences (including a visit to the plant in Kleve) on the topic of pyrolysis. Interesting insights into the challenges but also opportunities that the tasks and technologies mentioned entail.
December 2023	COSIR	CETENMA	Exchange of additional technical and financial information regarding the technology for the valorisation of UCOs after the study visit.

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Date	HOOP member	HOOP partner	Interaction
February 2024	Bodo	ACR+	Information about a project on public procurement (ProCirc) mentioned during a HOOP Lunch Talk.
May 2024	Bodo	Sara Bedin	Exchange of information after the HOOP Lunch Talk presented by Sara Bedin on Innovation Public Procurement.
June 2024 – March 2025	Cologno Monzese	Sara Bedin	Request for evaluation of municipal documents related to the initiative for the redevelopment of the composting plant launched through a public notice to collect project finance proposals pursuant to Art. 193 of Legislative Decree 36/2023. The assistance included the identification of lists of scientific experts and the evaluation of concession models, project financing, and procurement alternatives for the redevelopment and management of the facility located within the municipal territory.
August 2024	Oisterwijk, Brussels Environment, ARN BV (no member)	AWM (Lighthouse Münster)	Following the HOOP Conference in Brussels, HOOP LH Münster and the HOOP members had a knowledge exchange on different technologies: Thermal Pressure Hydrolysis (of diapers) in Nijmegen (NL), potential implementation of pyrolysis at AWM in Münster. Common realization that innovative projects in both approaches are often impaired in their implementation by regulatory restrictions.
January 2025	Oisterwijk	ACR+	Request of support for the preparation of a public tender for the renewal of the contract for recycling municipal biowaste, including provisions on high-quality recycling possibilities.

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Date	HOOP member	HOOP partner	Interaction
February 2025	Amsterdam	ACR+, Brussels Environment	The HOOP Member Amsterdam expressed interest of the regulation regarding decentralized composting. ACR+ shared examples of legal adaptation implemented in France, and connected them with HOOP Member Brussels Environment that defined a specific legal framework for decentralized composting, which led to direct interactions between both HOOP Members
June 2022 – March 2025	Turin	Sara Bedin	HOOP expert had a knowledge exchange aimed at evaluating procurement strategies towards living lab models. Assessment of opportunities offered by Italian national funds versus European programs (Horizon Europe, LIFE, Innovation Fund), focusing on specific innovation procurement calls for the bioeconomy sector.

During the extension period, members have been encouraged to complete the survey for the HOOP Bio-Circularity Label to get access to tailored technical support. 5 cities filled in the information. Then, the HOOP technical partner BaxCo followed up organizing bilateral meetings and exchanges with the members. A description of these interactions is provided below.

6.1. Niepolomice (PL)

The city scored 48/100 in the HOOP Bio-Circularity Label.

All HOOP members that supported the process: CETENMA, ANCI Lazio, ACR+, Science for change, SAV, CSCP.

Activity 1: Meeting with the city following their completion of the HOOP Circular Label (17/01/2025). BaxCo assessed the results and explored additional waste management challenges with the city. Outcome:

- *Engagement on scalable waste management due to projected population growth.*
- *Discussions on household and green waste, highlighting the recent distribution of composters.*
- *Challenges identified in sludge management and budget constraints for waste treatment.*

Activity 2: First interaction with the city after the meeting (17/01/2025):

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A summary of the meeting has been sent to the city with links to specific resources.

Key topics discussed:

- ***Population growth & waste management challenges****:*
  - *Expected population growth by 2050 requires efficient and scalable waste management.*
- ***Household waste & green waste:***
  - *Households are the primary biowaste source in Niepolomice. Recently the municipality issued several 1000 composters to the citizens.*
  - *There is significant potential to optimize green waste management, especially given the availability of resources for processing garden and green waste.*
  - *Current waste management costs are high due to the absence of local installations, which increases transport expenses and dependency on external facilities.*
- ***Sludge challenges****:*
  - *Large quantities and quality of sludge remain a challenge, with proposals for agricultural reuse under consideration.*
- ***Budget & funding:***
  - *Budget constraints exist, but piloting activities could be considered especially in the field of green waste and sludge initiatives.*

Activity 3: Input from other HOOP partners:

- *Almere Lighthouse has successfully grown and has been suggested as example for the issues related to population growth.*
- *Regarding home composting, CETENMA suggested to get in contact with Kuopio for their long-standing experience.*
- *For sludge management, a connection with Murcia has been suggested, particularly by joining the final event, which will focus on Murcia's wastewater management, including sludge treatment. This would allow Niepołomice to connect with wastewater management experts.*
- *CETENMA suggested that, while R&D funds for biowaste collection pilots may be difficult to secure, funding for valorisation projects is more feasible. The European Commission will soon launch Cluster 6 of the Horizon Program, and CETENMA (as Coordinators) will support Network members in applying and networking. Finally, networking opportunities would be available at the Final Event & Study Tour in Cartagena.*
- *ACR+ shared a list of resources produced within the LIFE BIOBEST project. The project also offers direct support, consisting in several calls to discuss their initial situation, an assessment, and then proposition for solutions, possibly bringing experts from other cities that developed practical solution.*

6.2. Águeda (PT)

The city scored 48/100 in the HOOP Bio-Circularity Label.

All HOOP members that supported the process: CETENMA, ANCI Lazio, ACR+, Science for Change, SAV, CSCP

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Activity 1: Meeting with the city following their completion of the HOOP Circular Label (24/01/2025). BaxCo assessed the results and explored additional waste management challenges with the city. Outcome:

- *Discussion on waste management infrastructure, including plans to develop an eco-centre.*
- *Need for regulatory updates and policy guidance to improve waste management practices.*
- *Identified opportunities for citizen engagement and gamification tools to improve waste separation.*

Activity 2: First interaction with the city after the meeting (24/01/2025):

A summary of the meeting has been sent to the city with links to specific resources.

Key topics discussed:

- ***Waste management challenges****: Need to improve recycling and composting practices.*
- ***Infrastructure development****: Plans to build an eco-centre for better waste management and the need for improved infrastructure to handle biowaste were discussed.*
- ***Regulation challenges:*** *Need for policy changes to support better waste management practices were mentioned.*
- ***Citizen engagement****: Raising public awareness and education on waste separation.*
- ***Collaboration****: Exploring partnerships with other municipalities and organizations.*

How HOOP can support:

- ***Provide educational tools****: Supply resources and strategies, including gamification apps, to enhance citizen engagement:*
  - *HOOP handbook on evaluation and improvement of bio-circularity: here*
  - *HOOP handbook on Developing urban circular bioeconomy investment projects: here*
  - *HOOP handbook on Collection and valorisation of urban biowaste: here*
- ***Technical support****: Offer assistance with lab testing for compost quality and expertise in biowaste management.*
- ***Facilitate networking****: Support the establishment of partnerships with other municipalities and organizations: HOOP handbook on Engaging stakeholders for the urban bioeconomy: here*
- ***Policy guidance****: Share insights and recommendations to support policy updates for effective waste management.*

Activity 3: Input from other HOOP partners:

- *LIPOR has expressed availability to assist Network Members on waste management challenges*
- *CETENMA can provide support for the development of an eco-centre and improved biowaste processing facilities and can assist with lab testing for compost quality and biowaste management expertise.*

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- *ANCI Lazio has expressed availability to assist Network Members in improving citizen engagement strategies.*
- *CSCP and Science for Change can provide additional resources on stakeholders engagement, such as gamification strategies and engagement tools.*
- *ACR+ shared a list of resources produced within the LIFE BIOBEST project. The project also offers direct support, consisting in several calls to discuss their initial situation, an assessment, and then proposition for solutions, possibly bringing experts from other cities that developed practical solution.*
- *RdA provided some feedback to the city related to their need of policy guidance.*

6.3. Póvoa de Varzim (PT)

The city scored 69/100 in the HOOP Bio-Circularity Label.

All HOOP members that supported the process: CETENMA, ANCI Lazio, ACR+, Science for Change, SAV, CSCP, BaxCo.

Activity 1: Meeting with the city following their completion of the HOOP Circular Label. BaxCo assessed the results and explored additional waste management challenges with the city (04/02/2025). Outcome:

- *Follow-up with the city, sharing relevant materials from HOOP partners.*
- *BaxCo facilitated connections to resources addressing Póvoa's specific challenges.*
- *Key topics discussed included OFMSW collection (30-40% coverage), garden waste collection, and an upcoming anaerobic digestion pilot, followed up with the city and shared the materials coming from different partners/resources in HOOP.*

Activity 2: First interaction with the city after the meeting (04/02/2025):

A summary of the meeting has been sent to the city with links to specific resources.

Key topics discussed:

- ***OFMSW (Organic Fraction of Municipal Solid Waste) collection:***
  - *Current coverage: 30-40% of households, mainly in the city. No coverage in rural areas.*
  - *Only one collection point, with treatment by LIPOR.*
- ***Garden waste collection:*** *Managed by the city.*
- ***Anaerobic digestion pilot project:*** *Planned for March with DL, aiming to expand collection to rural areas.*

Open questions:

- *The pilot lacks a cost analysis and a clear definition of transportation and collection vehicles.*
- *The city plans to engage local stakeholders over the next 2-3 years.*

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How HOOP can support:

- ***Label validation:*** *Assessed and accepted.*
- ***Cost analysis and vehicle definition:*** *BaxCo searched for support among HOOP technical partners.*
- ***Expanding biowaste collection to rural areas:*** *Some success stories have been shared.*
- ***Provide educational tools:***
  - *HOOP handbook on evaluation and improvement of bio-circularity: here*
  - *HOOP handbook on Developing urban circular bioeconomy investment projects: here*
  - *HOOP handbook on Collection and valorisation of urban biowaste: here*
- ***Facilitate networking****: Support the establishment of partnerships with other municipalities and organizations: the HOOP handbook on Engaging stakeholders for the urban bioeconomy: here*

Activity 3: Input from ANCI Lazio (received 20/02/2025; shared 28/02/2025):

ANCI Lazio shared its experience and strategy on regional biowaste management. In particular, they focused on the expansion of biowaste collection to rural areas. Albano Laziale has introduced a structured door-to-door collection system managed by its in-house company "Volsca Ambiente e Servizi", which includes organic waste collection. The system is designed to maximise participation by offering clear guidelines and collection schedules, ensuring high levels of compliance. A key element of success has been community engagement and education to improve sorting efficiency among residents. They shared a **useful guide to sensibilise inhabitants on separate collection**.

Additionally, the Lazio Region has issued specific guidelines for implementing **Pay-As-You-Throw (PAYT) schemes,** linking waste production to service costs. This system has been particularly effective in rural and low-density areas, where individual accountability encourages correct waste separation. Several municipalities, including for example the municipalities of Palestrina and Albano Laziale, have adopted PAYT, leading to a reduction in residual waste and increased organic waste recovery.

Finally, Albano Laziale has also established a **Register of Composters** to encourage home composting as an alternative to organic waste collection. Households and businesses that commit to composting their organic waste can register and benefit from **reductions in waste collection fees**. This initiative has been particularly successful in rural areas, where composting at home or in community spaces reduces the need for frequent biowaste collection and promotes circular economy practices.

These approaches demonstrate that a combination of structured collection programs, citizen engagement, and economic incentives can significantly improve biowaste collection, even in rural contexts. Furthermore, the possibility to use a **Municipal anaerobic plant like the system used by other HOOP Lighthouse in Porto** would be a highly effective strategy to improve the treatment capacity of biowaste, enhance energy recovery through biogas production, and contribute to a more circular and self-sustaining waste management system.

Activity 4: Inputs from other HOOP partners (07/02/2025):

- *The contact to CSCP has been shared to provide relevant deliverables on the topic of stakeholder engagement, particularly from the HOOP and SCALIBUR projects.*
- *CETENMA could provide guidance on transportation and collection vehicle selection.*

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- *ANCI Lazio and Kuopio have experience in implementing successful biowaste collection models in rural areas.*
- *RdA has been contacted to provide support on the cost analysis but, in the meanwhile, the city managed to do it internally.*
- *ACR+ shared a list of resources produced within the LIFE BIOBEST project.*

6.4. Pays de la Loire (FR)

The city scored 69/100 on the HOOP Bio-Circularity Label.

A discussion has started also with Pays de la Loire but for the moment not further activities can be reported.

Key topics discussed:

- *Challenges in organizing biowaste separation and the importance of clear communication strategies.*
- *The critical role of behavioural change and community engagement in waste management efforts.*
- *Available resources and tools to improve waste separation, including workshops and digital applications.*
- *Inspiring success stories and best practices from other European regions.*
- *The need for robust indicators and evaluation tools to enhance decision-making in waste management. They have an observatory that they would like to strengthen.*
- *Opportunities for collaboration and resource-sharing from HOOP.*

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7. Conclusions

The implementation of the one-on-one capacity-building activities within the HOOP project has proven to be a pivotal mechanism in fostering knowledge exchange, enhancing technical expertise, and accelerating the adoption of circular bioeconomy practices among participating cities and regions. The engagement of HOOP Members through targeted activities activated opportunities for direct interactions, enabling participants to address specific challenges, share best practices, and explore innovative solutions tailored to their local contexts.

One of the primary strengths of this approach has been the ability to adapt and respond dynamically to the evolving needs of the HOOP Members. The identification of key topics of interest, facilitated through structured surveys and feedback mechanisms, ensured that the activities remained relevant and valuable. The emphasis on direct exchanges, as opposed to generalised guidance, has played a crucial role in fostering trust and cooperation among participants, allowing for in-depth discussions and more targeted support.

The HOOP Lunch Talks series emerged as an effective tool for knowledge dissemination, enabling regular discussions on specific technical and strategic aspects of urban bioeconomy. Although participation varied, the recorded sessions available in the Hub ensured that the insights shared during these events will remain always accessible to all HOOP Members. The study visits, on the other hand, provided a more immersive learning experience, strengthening the connections between cities and reinforcing the practical application of circular economy principles. These in-person interactions facilitated a deeper level of engagement and often led to follow-up discussions and collaborations beyond the visits themselves.

The technical support component, despite initial challenges in engagement through formal request mechanisms, ultimately demonstrated its value through direct interactions facilitated during meetings and events. The shift towards more proactive outreach and personalised guidance enabled HOOP Members to receive tailored assistance, whether in designing new waste management strategies, optimising existing processes, or exploring financial and regulatory pathways for bioeconomy investments. The integration of the HOOP Bio-Circularity Label further enhanced this process, providing a structured assessment framework that helped cities identify areas for improvement and leverage the expertise available within the network.

The lessons learned throughout these capacity-building activities underline the importance of adaptability and responsiveness in supporting cities and regions in their transition towards circular bioeconomy models. The combination of structured learning sessions, study visits, and personalised support has created a comprehensive approach that not only builds technical capacity but also strengthens collaborative networks, paving the way for sustained impact beyond the project's duration.

Looking ahead, HOOP experience highlights the significant role that targeted capacity-building initiatives can play in bridging the gap between policy aspirations and practical implementation, ultimately contributing to the broader goal of fostering sustainable urban bioeconomy ecosystems across Europe.

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