D8.7

Report summarising the results of the different National Replication Workshops

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List of acronyms

Acronym	Description
AEMA	Association of environmental companies in Murcia Region (Spain)
AI	Artificial Intelligence
AMUSAL	Association of companies of the Region of Murcia
CAS	Czech Academy of Sciences
CEO	Chief Executive Officer
CONOE	Italian National Consortium for the Collection and Treatment of Used Vegetable and Animal Oils and Fats
COSIR	Consorzio Servizi Imprese Riunite
ERDF	European Regional Development Fund
GDP	Gross Domestic Product
HoReCa	Hotel Restaurant Catering
IPP	Innovation Public Procurement
ISPRA	Italian Superior Institute for Environmental Protection and Research
L	Litre
NRW	National Replication Workshop
OMEP	Organisation of Entrepreneur, Professional and Managing Women
PDA	Project Development Assistance
PERNU	Portuguese Strategic Plan for Non-urban Waste
PERSU	Portuguese Strategic Plan for Urban Waste
PHA	Polyhydroxyalkanoates
PhD	Doctor of Philosophy

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Acronym	Description
PNGR	Portuguese National Plan for Waste Management
P3HB	Poly-3-hydroxybutyrate
Q&A	Questions and Answers
RAI	Radiotelevisione Italiana
RDI	Research and development and innovation
REAS	Alternative and Solidary Economy Network
SME	Small and Medium-sized Enterprise
UCO	Used cooking oil
VKU	German Association of Local Public Utilities
WEEE	Waste from Electrical and Electronic Equipment

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1. Executive summary

The National Replication Workshops (NRW) consist of an event organised by HOOP Lighthouses, targeting other cities and regions at national level, and primarily aiming to promote the replication of the HOOP project's outcomes and of their achievements. HOOP Lighthouses were given much flexibility to adapt the event to their need, resources, and objectives.

Each Lighthouses developed very different activities for their National Replication Workshop, reflecting different contexts and goals:

- **ALBANO LAZIALE** engaged in different activities to promote its activities within the HOOP project to different audiences: raising awareness to citizens and students on circular economy with citizen science activities, discussing citizen involvement with other cities, or investigating innovative valorisation routes for used cooking oils with local companies by organising study visits.
- **ALMERE** organised a discussion with several different local and regional authorities in the Netherlands, by presenting Almere and Münster's activities developed during the HOOP project, especially to improve the collection rate and the quality of biowaste.
- **BERGEN** took advantage of the second edition of the "Biopark Conference", where the main topic of discussion was how bioresidues can contribute to make the food and feed sector in Norway more sustainable, bringing together public authorities, start-ups, investors, and end-users of bioproducts.
- **KUOPIO** organised a discussion with different public authorities and waste management companies regarding how biowaste management could contribute to the current Finnish strategy for bioeconomy.
- **MÜNSTER** took advantage of an event organised by the German Association of Municipal Waste Companies to present how the HOOP project could support other German municipalities to improve biowaste management and how Münster aims to improve the recovery of its biowaste.
- **MURCIA** organised a training session on Public Procurement of Innovation targeting other Spanish municipalities to encourage them considering innovative solution for municipal services.
- **PORTO** proposed a training session directed to other Portuguese local authorities, including group discussion and presentation of HOOP tools to support local urban bioeconomy approaches.
- **WESTERN MACEDONIA** took advantage of the 87th Thessaloniki's International Fair to present its HOOP related activities on citizen engagement and awareness raising to fellow Greek municipalities, and to promote the HOOP Network as a way for them to build capacity.

Overall, the different events seem to have brought attention from different organisations at regional and national level. The lessons learned by the HOOP partners and especially the Lighthouses seem to be relevant for the participants, yet discussions highlighted some challenges for replication: the difficulty for local authorities to consider innovative solutions going beyond well-established practices, and the fragility of biocircular business model making financing challenging.

Many National Replication Workshop also allowed Lighthouses to establish strong connections with other players, such as national authorities, fellow municipalities and waste management companies, or key players of the circular bioeconomy value-chain. Such connections are essential to secure the continuation of HOOP-related activities for all 8 Lighthouses.

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2. Introduction

Urban biowaste is an important environmental issue, as each European generates around 200 kg of urban biowaste per year. The current systems for urban biowaste treatment (i.e. composting) do not use their whole potential and the final products do not have a high added value. Circular bioeconomy offers innovative solutions using biowaste as resources for obtention of high added value bioproducts. However, their implementation on industrial scale faces important barriers, not only technical, but also economical, legal and administrative, among others. HOOP project offers project development assistance (PDA) and tools to overcome these barriers in 8 cities and regions of Europe.

2.1. HOOP national replication strategy

An important aspect of HOOP replication strategy consists in capitalising on the experience of the HOOP Lighthouses and facilitate the dissemination of their achievements to the cities and regions at national level. This approach has several benefits: it enables an exchange among peers sharing the same roles and responsibilities, but also experiencing the same regulation and national "framework conditions" (economic instruments, market conditions, etc.). This national replication strategy includes different activities, such as the publication of "National Action Manuals". Another important element of this strategy is the organisation by each HOOP Lighthouse of a "National Replication Workshop".

2.2. National Replication Workshops

The National Replication Workshops (NRW) consist of an event organised by HOOP Lighthouses, targeting other cities and regions at national level, and primarily aiming to promote the replication of the HOOP project's outcomes and of their achievements. The principle, possible content, and format of the NRW were laid down in "D8.3 - HOOP guidance for the organisation of National Replication Workshops", published within the first year of the HOOP project. Even though the general objective of NRW was fixed by the project, HOOP Lighthouses were given much flexibility to adapt the event to their need, resources, and objectives. NRW can take the format of a conference, a workshop, a training session, or a study visit, and could also explore other topics, such as policy recommendations to improve the national framework to promote local circular bioeconomy strategies.

For the organisation, HOOP Lighthouse could rely on the support of several HOOP partners: ACR+, CSCP, Greenovate!Europe, and Science for Change. Discussions were organised to decide on the format, content, and overall organisation of each NRW, ensuring that it was aligned with the objective of replication. A template was developed by CSCP to collect the key information and outcomes of the different workshops, which are used as a basis for this report.

This report aims to present the main outcomes of each NRW and how they promoted the replication of the HOOP project's findings to cities and regions across Europe.

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3. Albano Laziale

3.1. General information

Table 1. General information on National Replication Workshop Albano Laziale

Title of event	More events
Type of event	Conference/Stakeholders meetings
Location	Italy
Date, duration	05/04/2023 - ongoing
Organisers, moderators	ANCI Lazio, the Municipality of Albano Laziale, Science for Change, CONOE

3.2. Organisation and content

Goal: The replication journey of Albano Laziale consisted in a series of events (in-person and online) where, the HOOP Lighthouse supported by ANCI Lazio could present their activities within the project and build connections with key local stakeholders.

Organisation and partners: a first online event was organised in April 2023 in collaboration with NAFIGATE (PHA patent holder) and CETENMA, involving key national and regional cosmetic stakeholders. During the meeting, innovative biowaste valorisation solutions have been presented and explored. The HOOP Lighthouse used this meeting as an occasion to start building a partnership with companies interested in investing in the valorisation technology identified by Albano along its HOOP PDA.

In April 2023, HOOP joined the Riscarti Festival, in Rome, an event aimed at raising awareness on waste through art. The objective of the festival is to educate, engage and build a new knowledge on sustainability focusing on waste as a resource for creativity. Albano Laziale, participated in a press conference and, with the support of Science for Change, organised a workshop to present and promote the “HOOP Trainers” citizen science app. The event was closed with a Biowaste Club. Furthermore, ANCI Lazio was present with a stand collecting different HOOP communication materials.

In November 2023, the HOOP Network member CONOE (National Consortium for the collection and management of vegetal and animal used cooking oils), invited Albano Laziale and ANCI Lazio to present a business model for PHA bioplastic production and other valorisation technologies within a round table organised at

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Ecomondo, an internationally well-established fair engaging stakeholders, policy makers, opinion leaders and local authorities to discuss on the ecological transition. The speakers of the roundtable have been:

- *Francesco Mancini, Director of CONOE, National Consortium for the Collection and Treatment of Used Vegetable and Animal Oils and Fats*
- *Andrea Vignoli, Project Manager ANCI Lazio, European project HOOP* (Horizon 2020)*
- *Luca Andreassi, Professor Faculty of Engineering of the University of Rome "Tor Vergata" - Deputy Mayor, Municipality of Albano Laziale (HOOP Lighthouse)*
- *Marcello Vernola, Professor Lawyer, Legal Expert at the Technical Staff of the President of the Autonomous Region of Sardinia*
- *Antonino Biundo, PhD, Co-founder and CEO REWOW srl*
- *Ilaria Lorusso, Chief Legal Officer REWOW srl*

A key event to address innovations for the recovery used cooking oil (UCO) took place on 1 December 2023, when the HOOP Lighthouse Albano Laziale, in collaboration with ACR+, organized a study visit at the NAFIGATE headquarters in Prague. The visit aimed to explore the innovative potential of valorising UCO, showcasing advanced technologies capable of converting UCO into valuable bioproducts, such as bioplastics.

As follow up of the visit, an additional event has been organised by ANCI Lazio and the HOOP Network member CONOE. During the event, stakeholders explored the financial and technical requirements for scaling up valorisation technologies for used cooking oils.

Finally, Albano Laziale, with the support of ANCI Lazio, planned to organise an event in February 2024, in collaboration with the HOOP Network member municipality of Ciampino. The event was supposed to show the opportunities offered by innovative biotechnologies applicable to the municipal solid waste sector, with a concrete example for the enhancement of used vegetable oils gained through the HOOP project. The agenda is presented below. Unfortunately, due to last minute aversive circumstances, the event was not held. The 6-month extension will give the opportunity to replan the event within the lifetime of the project.

Agenda of the cancelled event:

Table 2. Agenda of National Replication Workshop Albano Laziale

9.30 Introduction

- Welcoming words, *Mayor of Ciampino*
- Introduction, *President of ANCI Lazio*
- Presentation of the event, *Municipality of Ciampino*
- The role of ANCI Lazio in supporting innovation in Municipalities, *ANCI Lazio*

10.10 Innovative Biotechnologies for Urban Waste Management: Project Overview – HOOP and the Replication Cities Network

- Presentation of innovations in organic waste treatment

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- Discussion on the opportunities offered by biotechnology for the municipal solid waste sector
- Concrete example of the HOOP project and the valorisation of used vegetable oils
- Presentation of the city of Albano Laziale regarding the city's involvement as a HOOP lighthouse
- The contribution of the city of Ciampino as a replicating city
- The value of used vegetable oils for the bioeconomy – the role of CONOE

11.00	Coffee Break
11.15	**Circular Economy Strategy in the Lazio Region** • Challenges and opportunities related to regulatory changes in the municipal waste sector • Diversification strategies of the investor companies • Presentation of good practices by participating companies Presentations given by the Councillor for Mobility, Transport, Land Protection, Waste, State Property and Heritage, and the Councillor for Environment, Sport, Climate Change, Energy Transition, and Sustainability - Lazio Region
12.00	**Discussion and Q&A session**
13.00	**Conclusions and Closing of the Meeting** - Networking Session

The replication impact extended beyond technical implementations. Through initiatives like the Italian Bioeconomy Changemakers Festival in Rome (held on 14 March 2024) and the ECOFUTURO Festival on 8 May 2024. these events facilitated educational outreach to youth, entrepreneurs, and public and private stakeholders, creating awareness around the replicability of HOOP solutions. These actions have built strong momentum for future adoption of circular economy practices across Italy.

Description of the events:

- **10th edition of "Riscarti" creative recycling Festival (14/03/2024).** A total of 791 people registered using signature sheets, mainly citizens and students from the city of Rome and neighbouring municipalities. Specifically, 241 from the city of Rome, 75 people from 18 municipalities other than Rome, in Lazio; 1 person from Lombardy, 2 from Campania, 1 from Abruzzo, 1 from Puglia and 1 from Tuscany. The remaining 465 did not specify where they came from.
  The objectives set and achieved by ANCI Lazio for the initiative were as follows:
  a) disseminate the ongoing activities within the HOOP project.
  b) make known the "HOOP Trainers" app.
  c) organise a Biowaste Club in Lazio.

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For point a) the good attendance at the Festival met expectations and at the stand set up by ANCI Lazio all the brochures and bookmarks prepared were sold out, the posters and 2 HOOP roll-ups remaining in good view.

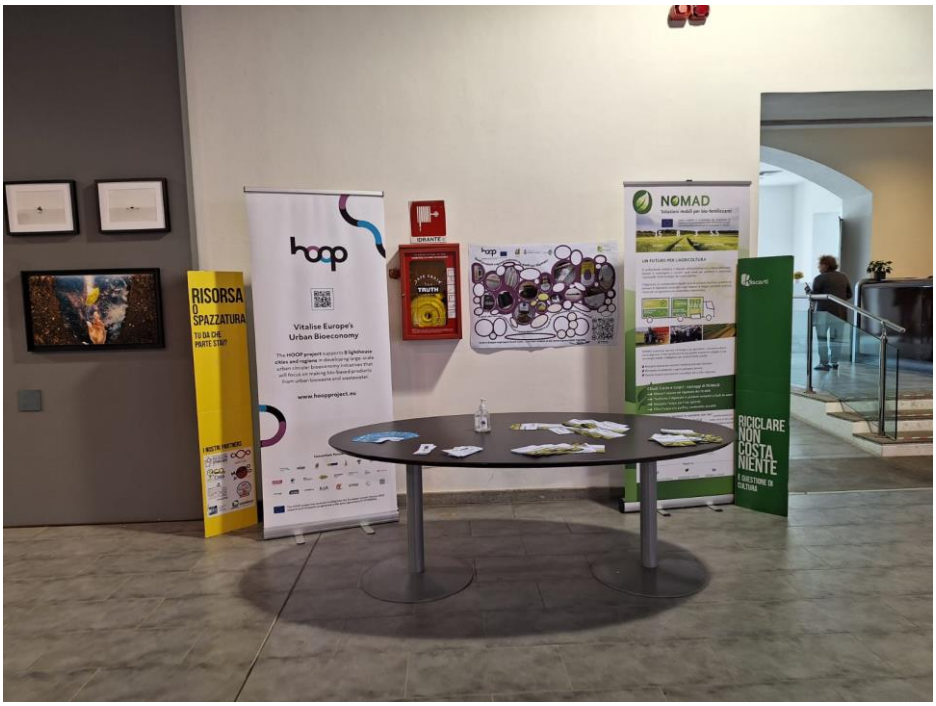

Figure 1. Stand organised by ANCI Lazio at the Riscarti Festival

For point b) the educational activity was carried out thanks to the direct participation of Science for Change and two schools participated in the meeting, one from the Municipality of Campagnano di Roma (Istituto Comprensivo IC Campagnano) and a second coming from Municipio I of Roma Capitale (Caravaggio Artistic Institute), with a total participation of 68 students involved in the educational laboratory.

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Figure 2. Educational activity organised by Science for Change at the Festival Riscarti

About the point c) the Biowaste Club was held on 14 April 2023 in the presence of 42 people (including the 5 speakers). Andrea Vignoli presented the HOOP project, and the dialogue focused on the importance and communication strategies regarding circular economy. Andrea Vignoli opened the works illustrating how in recent years ANCI Lazio, thanks to European projects and in particular the research and development projects of the HORIZON 2020 programme, is working to stimulate the waste valorisation chain at local level. There is much to implement on separate waste collection and just as much know-how to transfer.

The on-going dialogue with companies in Lazio region has been presented, in particular the excellent synergy created with a group of companies operating in the sector of used vegetable oil, and with the cosmetic sector, with the objective of producing bioplastics to be used in the cosmetic production process, to replace the conventional plastics. It was stressed that all this is possible thanks to the implementation of the collection of used cooking oils in cities.

Albano Laziale worked in a close relationship with schools, Ancitel Energia e Ambiente and developed, thanks to the HOOP partnership and in particular with Science for Change, a Web App to raise awareness of the best knowledge of the possible forms of valorisation through biotechnology of the waste produced right from our homes.

The following intervention, by Giuseppe Rinaldi of Ancitel Energia & Ambiente, underlined the existence of the support service for the Municipalities through the GerRi2Co project (https://www.progetto-gerico.org/) in support of the Municipalities of Lazio to improve the urban waste management service and the “Green Learning 360°” project which offers the opportunity for teachers and students in Lazio region to have an interactive visit to the various types of waste valorisation plants.

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Letizia Palmisano, journalist and Eco blogger explained the importance of recycling and lengthening the life cycle of products, through further ideas with contributions from the art world. But also listen to the commitment of the municipalities to positively influence the citizens' separate and quality waste collection. Some sectors such as textiles are still less developed in terms of information, while it is precisely from the collection of used yarns that a new supply chain or new products can be generated. Another example is the oil collected in schools.

Chiara Bolognini, science journalist at ISPRA explained the importance of emotion in communication and dissemination activities. An example is offered by the Italian communication campaign “Facciamo circolare” ("Let's circulate") which sees the campaign logo with a girl playing with a hula-hoop representing the commitment to work together to work for a circular economy for the planet. It is important to remember to talk about the environment as something that does not exist outside of us, as the linguist George Lakoff well expresses in his book "Don't think about the elephant!" and shift the focus more from “ego to echo”.

Marco Gisotti, RAI 3 journalist and author of the book "Ecovisioni", quotes the scientist Giacomo Luigi Ciamician, who theorized green chemistry in 1911 and underlines how artists, and writers in particular, are the best recyclers and how it is necessary to apply and imagine this ability to recycle materials as well. It is also important to know how to "attract" the reader, without lying and enticing them to operate in the most sustainable direction.

The Biowaste Club continued with a discussion on the key elements to engage citizens in separate waste collection. A strong and continuous communication is required to keep the citizens involved. Nevertheless, when awareness is not enough, the economic incentive can make the difference. In Crotone, for example, the use of the health card for waste separation seems to work very well since the gamification action comes into play. Where it is not economically advantageous for the citizen, it might be useful to highlight the advantage for the communities. For example, the collection of used vegetable oil in schools which produces a benefit for the school itself and highlighting for example that "this computer was purchased thanks to this fund ..." can work well as a driver for change. The importance of having proximity systems remains a very strong need. A national policy, or rather a national plan, would be needed to network experiences and to create proximity plants in strategic points (plants for the treatment of WEEE, glass and other fractions). Incentivising local plants also greatly reduces the need for transport of the various fractions. Gisotti also cited Richard Thaler, Nobel Prize winner for economics in 2017 and author of the book "A gentle push. Nudge: Improving Decisions about Health, Wealth and Happiness” which highlights how a reward is more effective than a penalty to help change behaviour towards more sustainable styles.

- **Roundtable with CONOE at Ecomondo (09/11/2023)**: the event was entitled “Treatment of Exhausting Vegetable Oils, Biotechnology and Investment Opportunities: Discovering Innovative Sustainable Solutions”. It constituted of a multidisciplinary dialogue dedicated to exploring opportunities and concrete cases that demonstrate how biotechnology and innovative financing are revolutionising the treatment of used vegetable oils, contributing to a more sustainable future. The meeting aimed to share knowledge about some innovations in the treatment of used vegetable oils through biotechnology and on which strategies to finance them. HOOP has been presented as a practical case, focusing on the power and potentiality of the HOOP Network.

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Figure 3. Promotion material of the roundtable at Ecomondo

- **Study Visit in Prague with Italian HOOP members (1/12/2023).** On 1 December 2023, six members of the HOOP Network of Cities and Regions 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 is receiving 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), the 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 members 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 them to gather first-hand information.

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Figure 4. Study visit in Prague

3.3. Outcomes and impact

Participation: the different events organised by Albano Laziale managed to present the HOOP project and its impact on the Lighthouse to many different participants at national level: other public authorities, companies engaged in bioeconomy, students, etc.

Key messages from the event: The PDA process within HOOP has showcased how public-private partnerships can unlock new opportunities. For example, the innovative Hydal Technology presents a promising solution for the local economy in the Lazio region. This project reinforces the importance of ongoing dialogue between ANCI Lazio, CONOE network, investors and European partners. The HOOP project has had a significant impact on its stakeholders by fostering strong collaborations between local governments, waste management organizations, industry partners, and academic institutions.

HOOP had a strong impact on the stakeholders involved by Albano Laziale as it fostered robust collaborations among local governments, waste management organisations, industry partners, and academic institutions. One of HOOP's major achievements is its ability to shape the future of the circular bioeconomy by actively engaging stakeholders and promoting the replication of innovative solutions. These efforts have encouraged stakeholders to unite in achieving the critical mass necessary for significant investments, such as those in UCO (Used Cooking Oil) in Lazio/Italy. Additionally, HOOP has highlighted the importance of scalable and adaptable solutions - such as bio-composting and biochar technologies - that can be effectively implemented across diverse regional contexts.

Challenges: One of the most significant challenges encountered was identifying economically viable solutions for scaling waste valorisation, particularly in the context of used cooking oils (UCO). Developing feasible business models requires deep collaboration with investors, local authorities, and regional stakeholders, as demonstrated by the ongoing partnership with CONOE.

Follow up activities: Through partnerships facilitated by the several replication and dissemination activities organised, Albano Laziale has collaborated with Friggioil Service Srl, which currently takes care of the transformation of used cooking oils into biodiesel, but through the HOOP guidelines and the network established at national level with the main players in cosmetics (COSMETICA ITALIA) and waste oils (CONOE) will aim to

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produce bioplastics such as PHA. Pilot actions have also been launched to improve the quality of organic waste in the HoReCa sector, with citizen science initiatives playing a key role.

More replication activities will be organised in order to guide more HOOP members to implement the collection strategy of Albano Laziale.

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4. Almere

4.1. General information

Table 3. General information on National Replication Workshop Almere

Title of event	Project HOOP & ISA present: Optimizing collection and valorisation of biowaste
Type of event	Webinar
Location	Online
Date, duration	19/06/2024, from 14.00 to 16.00
Organisers, moderators	Municipality of Almere and Working group ISA, with the support of AWM

4.2. Organisation and content

Goal: the event aimed to present the main lessons learned by Almere during the HOOP project, through the presentation of concrete practices to improve biowaste collection and recovery.

Organisation and partners: the webinar was organised by the municipality of Almere with the support of the working group ISA, and the support of the HOOP Lighthouse Münster represented by AWM.

Agenda:

Table 4. Agenda of National Replication Workshop Almere

Presentation of the HOOP Project, *Almere*
Optimizing household biowaste collection in Almere, *Almere*
Examples of creating value of biowaste in Almere, *Grondstoffencollectief Almere en Natuurvezelapplicatie Centrum*
Optimizing biowaste collection in Münster Germany, *AWM*
Current status of using camera technology for detecting contamination in biowaste, *Rijkswaterstaat*

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Description of the event: The presentations explained how the HOOP project supported the local biowaste strategies and activities in Almere and Münster.

Almere explained how different interventions allowed to improve and optimize biowaste collection: the replacement of duo-containers by 2 mono containers for residual waste and biowaste, the distribution of kitchen bins for residents in high-rise buildings, and the use of underground containers for biowaste next to high-rise buildings. All these activities have led to an increase in quality in all types of buildings. Besides, a communication campaign was organized to make residents sort their biowaste. The strategy focused on lifting reluctance to sort, make sorting more convenient, explain how to sort and why, and motivate them to keep their good habits. Almere shared several good practices: make the information delivered by credible people like collection crewmen, and the need to repeat communication and to provide regular positive (or negative) feedback to residents. To do so, Almere designed a system of yellow and red cards put on the waste bins whenever a non-compliance is identified by the controllers. Yellow cards lead to a visit by a waste coach, while red cards lead to penalties.

The different innovative valorisation routes explored by Almere for the upcycling of biowaste were also introduced. The presentation reflected on the challenge to determine a proper business model for them, due to the novelty of products or the inconsistency of e.g. garden waste generation. Other aspects, such as the dispersion of the feedstock, the high cost for waste collection, or the challenge to scale up pilot experiments, were also listed as key barriers.

AWM presented the biowaste management system in Münster, and the different new valorisation routes explored within HOOP such as pyrolysis. AWM also introduced several more targeted communication activities with key target audiences, such as children, schools, or refugees. A specific communication campaign aiming to improve the quality of collected biowaste, including general information, reminders, and finally controls of biowaste bins. AWM presented other actions to reduce the contamination and comply with the upcoming stricter German regulation on the presence of plastic in compost: a communication action in shops to raise awareness of the fact that biodegradable plastic cannot be used in the compost bin, and automatic detection of impurities using of AI-Based Image Recognition Technology in collection trucks.

4.3. Outcomes and impact

Participation: the event brought together about 10 organisations: municipalities, metropolitan regions, and public waste companies.

Key messages from the event: the event has brought several new insights for the attendees and has established new connections between municipalities, (technical) stakeholders within HOOP Project and German lighthouse AWM (Münster).

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5. Bergen

5.1. General information

Table 5. General information on National Replication Workshop Bergen

Title of event	Biopark Conference - National conference for the transition to a circular bioeconomy
Type of event	Conference
Location	Voss, Norway
Date, duration	21/03/2024
Organisers, moderators	BIR, Næringshagen Voss Hardanger, Land møter Hav

5.2. Organisation and content

Goal: the goal of the event was to share knowledge and create commitment to establish and invest in more circular bioeconomy initiatives, starting with inspiration and motivation. The key focus was how sustainable feed and food can be created in Norway, using the bio resources/residues both from land and sea. Fish feed is especially relevant considering the importance of the fish industry along the Norwegian coast.

Organisation and partners: to maximise participation and the potential for replication, it was decided to join an existing event called "The Biopark conference 2024". This conference focuses on the use of biological fractions in a circular and sustainable way. BIR received support from *Land møter hav,* a joint initiative between different bioeconomy industry clusters, and *Næringshagen Voss og Hardanger,* a business development consultant bringing different regional companies as members. This collaboration highly contributed to make the event attractive. They also partnered with the *Vestland Fylkeskommune* (Vestland County Council).

Agenda: the agenda is available in Norwegian here. The main sessions are summarised in Table 6.

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Table 6. Agenda of National Replication Workshop Bergen

9.30	**Introduction** Welcoming words by Land møter Hav Presentation of the Voss Biopark by BIR
10.10	**First session: New, sustainable feed materials for fish and land animals** • The government's new Mission Statement, *Forskingsrådet* • Can algae replace soy in fish and chicken feed? *AlgeNatura Expand* • Insect frass - how to use excrement from insects in a biopark? *Invertapro Expand* • Is short-term, sustainable feed on a large scale possible, and what is needed? *Nortura* • From invading starfish to valuable protein – inspiration from Greenlab Skive in Denmark *Danish Marine Proteine/ Vestjyllandske Andel*
11.45	Lunch
12.45	**Session 2 - Industrial bio-symbiosis** • Rå biopark - from by-products to key resources***, Rå biopark*** • Fish sludge and circular value chains, *Bolaks* • Vegetables + saltwater fish farm = a circular blue-green symbiosis, *Columbi Farms* • Area of use for biological CO2 from biogas plants, *HOOP CO2* • Sotenäs Symbioscentrum – inspiration from Sweden, *Sotenäs Symbioscentrum* • Upcycling of food waste, *Center for the upcycling of food resources*
15.30	**Session 3 - Ready, set, change?** • What role and responsibility does the *Verkemiddelapparatet* (Norwegian Government's instrument for innovation and development) have? *Bionova (Innovation Norway)* • A motivating investor view of the bioeconomy, *Momentum* • The role of big companies: what does it take to succeed? *Grieg Seafood*
17.10	Conclusion by the county deputy mayor of Vestland
17.30	Bio-Pitch organised by the Connect Ban Investor Network: presentation of circular companies and investment opportunities in the circular bioeconomy.

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Description of the event:

- **Opening of the Biopark Conference 2024:** the opening speech set the scene for the conference and explained how the topic is relevant. An overview of the HOOP project was given, including the tools and support systems that have been developed. The participants were also encouraged to follow the HOOP project and network, although not everyone is qualified. Then, the plan of the Bergen Region to produce bio-based products from biowaste was introduced, introducing the Biopark and industrial symbiosis with biogas and insect production. The opportunity to connect other technologies to the project, e.g. algae production, biochar, or other innovative processes, was also presented. BIR also insisted on the importance of stakeholder engagement. Finally, a local farmer was interviewed on the stage to talk about his perspective and involvement in the Biopark. His thought and practical perspective on the project highlighted the need to include such stakeholder in local circular bioeconomy schemes.

- **First session: new, sustainable feed raw materials for fish and land animals:** this first sessions consisted in a series of presentation of innovative biocircular technologies. First, the Norwegian research council was invited to talk about the “mission statement” on sustainable feed production that will be significantly scaled. Then, several presenters introduced innovative technologies to produce animal feed, with the recovery of algae, insect frass, or of invasive starfishes. To illustrate these presentations, a “larvae bar” was proposed by Invertapro and students from the climate club, where frass and larvae were sold to participants. There were also the possibility of tasting samples, which contributed to increase the acceptance of such products and acted as an icebreaker to kickstart discussion on such bioproducts.

- **Second session: industrial bio-symbiosis:** this session introduced different examples of Norwegian industrial symbiosis projects focusing on the bioeconomy. First, Rå introduced their biopark located in the north of the country centred around a biogas plant, which bears many similarities with the project of BIR. Then, Bolaks introduced their system to process fish sludge into biochar through pyrolysis. The speaker insisted on the challenge of finding investors, due to the high associated risks linked with the relatively low value of the end-product. This is emphasized by the fact that the positive environmental externalities cannot be economically valued. Government support is needed in this regard.

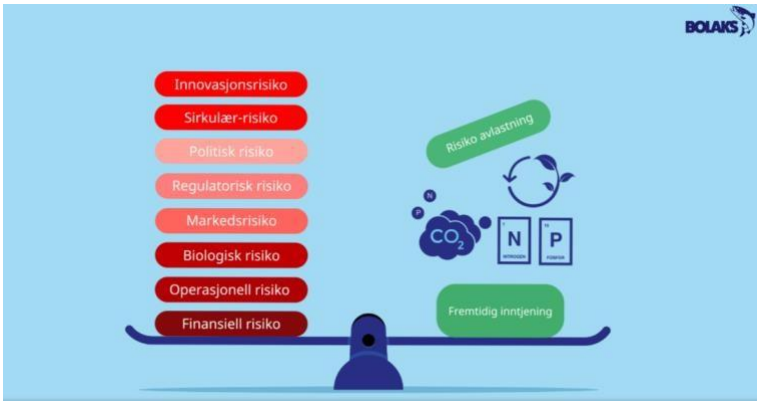

Figure 5: Illustration of the need to balance risks (source: Bolaks' presentation)

Two other Norwegian illustrations followed: from the south of Norway, we got insights on how aquaponics growing salad can be used to clean the water from a fish hatchery. The water from the hatchery is full of nutrients and is a good fertilizer. We were also given examples of how biogenic CO_2 from a biogas

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plant can be recovered, and the participants even got to try beer containing biogenic CO_2. The Swedish municipality of Sotenäs presented how they facilitated industrial symbiosis between local companies, leading to the establishment of new circular businesses and circular value chains. Municipalities are regarded as key enablers to do so, considering that they have the "bigger picture", a good overview of the local situation, and can easily establish connections among local players. Finally, Ommat, the newly established company at BIR Bedrift, talked about how they upcycle food waste to produce food and feed together with different cooperating companies. Their purpose is to identify, collect, sort and pre-process vegetable food resources to ensure the highest possible recycling of the resource. Ommat will be a natural part of the Biopark at Voss. Their ambition is to create a system that can be replicated, and they encourage all bioparks to include this kind of company.

- **Session 3: Ready, set change?** This last session focused on how to enable and promote circular bioeconomy projects through funds and investments. First, Siva and Bionova, a part of the Norwegian Government's instrument for innovation and development (*Virkemiddelapparatet*), presented calls and support for bio initiatives. A venture fund talked about the key criteria they look for in a company when investing; maturity, market potential and team composition being key. The lack of investment in sustainable agrotech and food systems compared with their share in total greenhouse gases emission that needs to be reduced in the sector was highlighted. Grieg Seafood, one of the largest salmon fish farming producers in Norway, presented their view on the larger company's role and responsibility in the food system. Farmed fish is more environmentally friendly than other types of animal proteins, but they also have many challenges to solve to become more sustainable, the inputs and outputs from the farms being key. But they also raised the question of how to measure circularity, and where to draw the line of what is sustainable. In today's market, cost will always be a key criterion.

- **Biotalks:** a panel discussion brought together five stakeholders representing five different parts and roles of the value chain. The main discussion points included the prerequisite to enable the circular bioeconomy, how circular solutions could compete on the feed production market, and what hinders investments.

- **Conclusion by the Vestland County:** the representative of the Vestland County summarized the main discussion points of the day, insisting on the potentials and challenges. He insisted on the crucial role of (local) government as enablers and facilitators, as illustrated by the Swedish presentation.

- **Biopitch:** a pitching session bringing together 6 startups, and 10 investors was then organized, to which the participants pre-registered. Investors included private investors, venture funds, and larger companies. Each startup had 10 minutes to pitch the project, after which investors had the possibility to ask

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questions. Most startups unfortunately lacked focus on the commercial value and clear business cases to demonstrate their value to investors.

- **Dinner:** the event ended with a dinner that 50% of the participants joined, which enabled more networking through informal chats, hopefully fostering further collaboration.

5.3. Outcomes and impact

Participation: in total, 138 people attended the conference, including the organisers. Participants included large companies, academia and government (on a local and regional level). There were participants from all over Norway: from Kristiansand in the south to Bodø in the north.

Feedback of participants: BIR received largely positive comments from participants, many mentioned getting inspirations from the presentations. Several participants also requested individual meetings with BIR for follow-up activities.

Key messages from the event: the event highlighted many different good practices revolving on circular food and feed, and biocircular industrial symbiosis. These different initiatives have a significant potential to make different sectors more circular and sustainable, such as the fish industry, and can be fostered by local government. However, many projects also reported critical challenges such as high risk linked with fragile business models, limiting the possibility of investments.

Challenges: some specific types of participants proved more challenging to attract, namely elected representatives at high level and farmers. BIR invited the minister, but he failed to come. A speaker was also supposed to represent the agricultural sector but could not come due to illness. It was also important to keep the fee low to ensure high participation and be accessible to e.g. startups and SMEs. A small fee was asked to participants to cover the cost of food. Finding a large venue also proved challenging.

Follow up activities: participants were thanked by the organisers and invited to share more feedback. Individual meetings are planned with the participants that expressed interest. A potential next event could focus on the tools and instruments to support the development of circular bioeconomy initiatives, where the HOOP Hub and associated services could be promoted.

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6. Kuopio

6.1. General information

Table 7. General information on National Replication Workshop Kuopio

Title of event	Promoting the Finnish Bioeconomy Strategy (2022-2035) – Sustainably towards higher added value
Type of event	Webinar
Location	Online
Date, duration	22/02/2024, 8.00 to 10.00
Organisers, moderators	SAVONIA UAS and city of Kuopio

6.2. Organisation and content

Goal: the webinar aimed at raising awareness and discussing the legislative development and innovative practices regarding collection and valorisation of biowaste throughout Finland. Furthermore, an online tool has been presented to use as a common space to share goals and concrete actions in the field of sustainable development and biowaste valorisation, also establishing new connections and strengthening existing networks to foster collaboration among various regions and cities in Finland.

Organisation and partners: the webinar was organised by HOOP partner Savonia UAS and has seen the active participation of the city of Kuopio.

Agenda:

Table 8. Agenda of National Replication Workshop Kuopio

8.00	**Opening of the event** The HOOP project and the HOOP Hub platform, *Harri Auvinen, RDI Manager, Savonia UAS*
8.15	**Introduction of workshop method** *Ulla Santti, RDI Specialist, Savonia UAS*

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8.35	**Climate and resource wise City of Kuopio** *Jari Kyllönen, Deputy Mayor, the City of Kuopio*
8:50	**The Finnish Bioeconomy Strategy 2022-2035** *Ulla Palander, Senior Adviser, Ministry of Economic Affairs and Employment*
9.10	**Update on waste management legislation and biowaste collection obligation, Biomakers** *Aki Malinen, Project Manager, Jätekukko*
9.20	**Soil improvement granules and biogas plant** *Antero Bäcklund, Development Manager, Lakeuden Etappi*
9.40	**Valorisation of biowaste campaign and resource wise roadmap of City of Pori** *Pepita Heurlin, Project Manager, City of Pori*

Description of the event:

- **Introduction:** the webinar was opened by a presentation of the HOOP project and its impact in the city of Kuopio in terms of PDA and stakeholder engagement strategies. Focus was put on the HOOP Hub as a place where to find all the key information about bioeconomy technologies and opportunities.

- **Introduction of workshop method:** the Padlet platform has been presented as a tool to share information about cities' bioeconomy strategies, projects and contacts. Participants were engaged to share:
  - the main goals of their city's sustainable development program
  - ongoing projects (name, website, social media)
  - successful examples of circular economy solutions
  - their contact information if interested in networking with other operators
  - other considerations/thoughts/ideas

Part of this section has also been reserved to the presentation of the HOOP Bio-Circularity Label as an instrument to evaluate the level of the city/region's bioeconomy strategy.

- **Climate and resource wise City of Kuopio**: Kuopio's Deputy Mayor presented the resource-wise programme of the city, which aims at becoming carbon-neutral by 2030, reducing greenhouse emissions by 80% compared to 2007 levels. A key role in the strategy is played by the collaboration with the SISU project, which seeks to harness the untapped potential of sufficiency solutions in Finland. The main aim is to ensure that the green transition and basic welfare state promises can be realised even with limited economic growth.
  Renewable energy is another key topic of Kuopio' strategy, for instance through the implementation of 320 solar panels that cover 85% of the Council house's energy needs. A circular approach is

implemented in the built environment by reusing construction and demolition material in street construction. Finally, in terms of mobility, the goal is to reach 80% of the public transport of Kuopio by using clean vehicles, such as electric buses, biodiesel vehicles and city bikes.
Together with a significant reduction of the CO_2 emissions and a transition to fossil-free transport, the city aims at promoting green transition projects and reducing consumption-based projects.

- **The Finnish Bioeconomy strategy 2022-2035:** the Senior Adviser of the Ministry of Economic Affairs and Employment highlighted the key role of bioeconomy for the industry sector (added value of 29.4 billion € in 2022). The vision for 2035 has a technology- and knowledge-based focus, with key relevance to RDI investments, sustainability and bioresource management. Strategic sectors have been identified: forest, food, waste and water biomass, bioeconomy services, textile and clothing, chemical industry, digitalization.

- **Update on waste management legislation and biowaste collection obligation**: Jätekukko Ltd. is a non-profit waste management company owned by 15 municipalities in Southern-East Finland, which provides all services related to waste management. Their comprehensive services include waste container deliveries and emptying, waste management service network, which includes recycling points, sorting stations and hazardous waste collection. Jätekukko Ltd. also provides advising on waste management matters. The operation area of Jätekukko Ltd. covers 215,000 inhabitants, including Kuopio. Following the new sorting obligation for biowaste, the company developed a series of initiatives named under “Biomakers” to engage citizens in the change promoting neighbourhood activities, providing biowaste containers and encouraging home composting. 900 households have been informed and the website developed to share information about this reached 460 visitors. For 2024, the goal is to engage more and more citizens to participate in the “Biokippa”: a group of inhabitants in the same neighbours can express their intention to organise a common collection area for recyclable waste (including biowaste, cardboard, plastic and glass packaging). This reduces the number of collection points and the cost for the citizens that can share the collection costs among max 5 households.

- **Soil improvement granules and biogas plant:** the Lakeuden Etappi is a waste management company founded in 1997 and owned by 8 municipalities in South Ostrobothnia. It has implemented a Pay-As-You-Throw system and manages 11 waste stations, covering 134,000 inhabitants. Since 2007, it manages a biogas plant, which, beyond biogas, produces hygienised Ranu-soil improvement granules (3,000 tonnes/ year), useful for field fertilisation and landscaping. Due to the change in the fertiliser regulation, pyrolysis is being investigated as an alternative.

- **Valorisation of biowaste and resource-wise roadmap of City of Pori**: a representative of the city of Pori, in Satakunta region, presented a roadmap approved in October 2023 to move to resource-wise operations. The road map identified 11 targets, and 89 actions divided into 3 themes: 1) Sustainability expertise; 2) Sustainable everyday life; 3) Sustainable green growth. In terms of biowaste valorisation, the city is investigating the challenges of expanding separate collection of biowaste and gather experiences on the use of shared bio containers. For this, a survey has been circulated among citizens and more than 80% of the respondents declared to have no problem with the new system of shared bio containers.

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6.3. Outcomes and impact

Participation: 30 people joined the online meeting. The audience consisted in a mix of local and regional authorities, public waste management companies and research institutes: Helsinki, Kajaani, Kouvola, Jämsä, Lahti-Lappeenranta, Kuopio, Pori, Lapua, Espoo-Vantaa, Suonenjoki, Regional Council of North Savo, Centre of Economic Development Transport and the Environment.

Key messages from the event:

- **Climate neutrality and resource wisdom are one of the main goals of the strategy of Kuopio City**. Kuopio is a pioneer city in circular economy and is committed to national pioneer projects (SISU and Circwaste) aiming to be a demonstrator city and to achieve the National Waste Plan of Finland. Kuopio city council has set two specific targets; Kuopio aims to be carbon neutral by 2030 and emission & waste free by 2050. One of the key objectives that have been set to reach these goals is that the amount of household waste in the Kuopio region will decrease and the recycling rate will increase to 65 % by 2030.
  The guidelines of the resource-wise work are defined in the Kuopio Resource Wisdom Programme, which was approved by city council in 2017. According to the programme, resource wisdom is promoted in six areas, one of which focuses on the circulation of materials, environmentally friendly procurement and sustainable consumption. Based on the preliminary study, in 2018, the recycling rates in Kuopio amounted to 56% for municipal waste.

- **BIOKIMPPA as a solution in obligation to sort biowaste.** One of the main challenges in waste management in Finland is that there is still significant portion of biowaste among mixed waste. In a total of 1/4 of the waste that ends up in a mixed waste container should actually belong in a biowaste container or a composter.
  In 2024, the obligation to sort waste will be tightened so that sorting biowaste will become mandatory in the largest urban areas. Jätekukko Ltd. offers BIOKIMPPA as a solution in obligation to sort biowaste. In the detached house areas, it is possible to organise a joint BIOKIMPPA of several households, which can reduce the household's annual costs from a couple of hundred euros to tens of euro. For example, the implementation of BIOKIMPPA for five detached houses in Kuopio, when the biowaste container (140 L) is emptied every 2 weeks the annual cost per household is 25.48 € whereas if every household had their own biowaste container the annual costs would be 127.40 € per household. In practice, BIOKIMPPA is a joint biowaste container which makes sorting biowaste easy and save costs. Before establishing BIOKIMPPA, households have to decide who is the contact person of their BIOKIMPPA and where the joint biowaste container is placed. When residents announce that they are establishing a BIOKIMPPA, Jätekukko Ltd. offers them a biowaste container free of charge. There is possibility to choose either a 140 L or a 240 L biowaste container, depending on how many households are involved. Jätekukko Ltd. takes care of emptying the joint biowaste container, and the bill for the emptying is sent either to the contact person of the BIOKIMPPA or directly to each member of the group. Sorting biowaste in this way is a small effort for the residents, but it has a huge impact on society.

- **The HOOP Biowaste Clubs increasing citizen engagement and collaboration in biowaste sorting.** It organised workshops for students and collaboration partners on reducing biowaste. The purpose of citizen engagement workshops was to awaken students to think about different solutions for minimizing and utilizing biowaste, such as the lack of space in private kitchens, how to reduce the amount of

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biowaste in the mixed waste of companies and restaurants and how to utilize biowaste better than at present. The atmosphere in the workshops was enthusiastic and created the basis for such innovative thinking, as well as for a more accurate sorting of biowaste among the students and their households. Jätekukko Ltd. was interested in pyrolysis technology for generating biochar for research purposes and Savonia University of Applied Sciences coordinated development of biochar pilot unit.

Follow up activities: Kuopio, represented by Savonia University, will keep meeting and exchanging ideas and solutions with other cities, regions and local stakeholders. By the end of the year, it aims at identifying regional practices and partnerships to build a project proposal that can boost their strategy.

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7. Münster

7.1. General information

Table 9. General information on National Replication Workshop Münster

Title of event	HOOP visioning workshop for Germany
Type of event	Workshop
Location	Duisburg, Germany (presential event)
Date, duration	19/06/2023
Organisers, moderators	CSCP, AWM

7.2. Organisation and content

Goal: the overall goal was to discuss several topics with other German municipal waste management companies : where they stand regarding biowaste, what their vision and challenges are, and how to reach their goals.

Organisation and partners: the meeting was organised during a half-day workshop organised by CSCP and the steering group of the German Association of Municipal Waste Companies, VKU. It was part of a larger event organised by VKU, yet the HOOP workshop solely focused on HOOP replication.

Agenda: the 90-minute workshop (Table 10) included an introduction of the HOOP Project, the resources available that can support German municipalities, and a discussion among German municipal waste management companies on the vision for the German biowaste sector.

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Table 10. Agenda of National Replication Workshop Münster

Activity
Warm-up
Overview of HOOP project and status-quo of biowaste recycling in Germany
Common development of visions: Bioeconomy in Germany till 2040
Next steps for the working group

7.3. Outcomes and impact

Participation: participants included 7 representatives from German municipal waste management companies that are part of VKU steering group, and representatives of VKU. The following cities participated in the workshop: Bassum, Duisburg, Köln, Wuppertal, and Georgsmarienhütte.

Feedback of participants: participants all showed interest for the topic and the HOOP project. Some of the participants were willing to further exchange and learn from the HOOP project.

Key messages from the event: the event managed to secure a connection between HOOP and the existing structures within VKU that tackle biowaste. More connections need to be explored between the association and the HOOP project and that municipal waste companies should look beyond composting and digestion plants.

Challenges: despite their interest in the HOOP project and results, it proved challenging to convince other municipal waste companies to go beyond their current on-going activities or project.

Follow up activities: following this event, it was proposed to explore further ways to connect the HOOP project to existing committees within VKU and to further present HOOP to other municipal waste companies.

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8. Murcia

8.1. General information

Table 11. General information on National Replication Workshop Murcia

Title of event	Murcia National Replication Workshop
Type of event	Conference and workshop
Location	Murcia, Spain + online participation for the IPP Workshop
Date, duration	09/11/2023, 9.00 to 14.00
Organisers, moderators	City of Murcia, CETENMA, AEMA-RM

8.2. Organisation and content

Goal: present the progress achieved and the lessons learned in the implementation of the urban circular bioeconomy at national level and propose a workshop on Public Procurement of Innovation (IPP), an instrument that was introduced to Murcia as part of the HOOP project development assistance.

Organisation and partners: the event was organised by the City of Murcia, as a part of the Green and Circular Entrepreneurship Meeting, co-organised by AEMA-RM. This was especially useful to ensure the participation of entrepreneurs along with municipalities. This was also relevant since the workshop on IPP was relevant to both public and private players.

Agenda:

Table 12. Agenda of National Replication Workshop Murcia

9.30	**Workshop on public procurement of innovation (IPP)** The role of administrations and companies – Hybrid session (in-person + remote)
11.00	Networking Café

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11.30	**Discussion:** "How to successfully start a circular bioeconomy project" Lessons learned from HOOP.
12.30	GREENDATE Networking event organized by AEMA , AMUSAL, REAS and OMEP Presentation of projects and awarding of diplomas of the SALTA! entrepreneurship programme, an initiative of OMEP Murcia Region.
14.00	Lunch

In the afternoon, participants could join the "Green and Circular Entrepreneurship Meeting".

Figure 6. NRW in Murcia

Description of the event:

The meeting opened with welcoming words from the President of AEMA and a representative of Murcia Municipality.

The first part of the workshop focused on IPP with presentations by SILO and HOOP partner Sara Bedin. The concept of IPP was explained. IPP can be used when a procurer has a need that cannot be satisfied by existing products, thus requiring innovative solutions and service-providers. IPP keeps the same principle and legal framework as traditional public procurement but has specific rules that enable innovation and allows for instance to procure for something that "does not exist yet". Considering the importance of public procurement (15% of the Spanish GDP), IPP represents a significant instrument to boost innovative solutions by providing financing to entrepreneurs to develop such solutions. The process for implementing a IPP was also explained, along with potential European funds to finance it (ERDF, HORIZON, etc.). The importance of market consultation was also reminded, for procurers to ensure that the IPP will attract companies. A concrete illustration of Santiago de Compostela was also given. Sara Bedin introduced HOOP activities on IPP, first recalling several challenges, especially the lack of harmonized regulation among Member States.

The second part of the event presented the HOOP approach, and the project development assistance provided to Lighthouses. In particular, the PDA developed for Murcia was introduced. Finally, HOOP services such as the Circularity Label and the HOOP Hub were introduced.

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8.3. Outcomes and impact

Participation: There was a total of 14 participants in presence (including the organisers), and 10 more participants joined the online workshop. Participants included entrepreneurs and entrepreneurs association, representatives of different municipalities: Murcia, Alcantarilla, Ceuti, Alicante, and Cartagena, and the Barcelona Metropolitan Area.

Feedback of participants: in terms of overall participation, the workshop was perceived as good. The co-organizer AEMA was very satisfied with the attendance rate and the contents. Attendees found extremely interesting and useful the proposed content.

Challenges: it proved challenging to involve more municipalities. The municipality could have benefited from more support in this regard.

Follow up activities: participants were sent the material presented during the event.

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9. Porto

9.1. General information

Table 13. General information on National Replication Workshop Porto

Title of event	Circularity: Challenges, Tools and Case Studies
Type of event	Training session
Location	Maia, Portugal
Date, duration	21 & 22/02/2024, 1 day and a half
Organisers, moderators	LIPOR and LIPOR Academy

9.2. Organisation and content

Goal: the main objectives were to organise a training session focusing on the topic of circularity and the associated challenges and opportunities, by presenting tools and case studies, and promoting sharing of good practices among participants.

Organisation and partners: LIPOR organised the event within the framework of its training programme called LIPOR Academy.

Agenda:

Table 14. Agenda of National Replication Workshop Porto

Day 1: 21/02/2024	
9.15	Welcome by *LIPOR CEO*
9.30	Framework – Sustainability - Paradigm transition – Circular Economy, *LIPOR*
10.45	Coffee break
11.15	Group discussion: barriers and opportunities, *moderated by LIPOR*

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12.00	Waste as a resource, legal framework, *LIPOR*
13.00	Lunch
14.00	HOOP Tools for promoting circularity, *RdA Climate Solutions*
15.30	Coffee Break
16.00	Cityloops tools, *LIPOR*
17.00	Conclusion, *LIPOR*
Day 2: 22/02/2024	
9.30	Circularity tools and indicators, *LIPOR*
10.45	Coffee Break
11.15	LIPOR Case Study, *LIPOR*
11.45	HOOP in LIPOR, *LIPOR*
13.00	Closing

Figure 7. Communication material

Description of the event:

The workshop was opened with a presentation on the concept of sustainability, providing scientific information on the impacts of human development and economy since the beginning of the first industrial revolution. Data and videos helped to frame the theme at global level. A second part of the presentation focused on the instruments and strategies that can be implemented by the industrial sector to reduce their environmental impact. A final reflection was done to engage companies to implement sustainable behaviours.

After a coffee break, the first group activity started splitting the participants into groups. As first focus, participants discussed on the main barriers for a circular European bioeconomy. The discussion identified the following as the main barriers:

- *Regulatory*
- *Lack of financing*
- *Lack of incentive/motivation for public participation*
- *Eco-design flaws*
- *Unbalanced cost-benefits (raw materials being cheaper than recycled materials)*

In the second session of the group activities, the groups identified a list of opportunities:

- *Innovation and creativity*
- *Artificial Intelligence*
- *High-value creation*
- *Connectivity and symbiosis*
- *Partnerships*
- *New incentives/incentivising mechanisms*

This interactive part was followed by a presentation on the legal framework of circular economy integrating the European and national levels. For Portugal, 4 are the main instruments to consider for biowaste regulation:

- *The National Plan for Waste management (PNGR 2030)*
- *Strategic Plan for urban waste (PERSU 2030)*
- *Strategic Plan for Non-urban waste (PERNU 2030)*
- *Strategy for biowaste*

All the instruments have been analysed considering the main objectives and measures.

The afternoon of the first day was dedicated to the presentation of some key tools for cities and regions: the HOOP tools available in the Hub (Bio-Circularity Label, Circular Valuation Method, Project Maturity Level), key HOOP documents and manuals (State-of-the-art of technologies, technology factsheets, Investment Package Manual, Novel circular business models in biowaste valorisation, Due diligence standard) and websites for funding opportunities. An additional presentation was delivered to describe the results and tools developed by the Cityloops project, which see LIPOR among the project partners for the focus on biowaste.

The second day started with a presentation on instruments and indicators to evaluate circularity. After a short introduction on the role played by the monitoring process to ensure a successful project, the presentation

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focused on the European Circular Economy Monitoring Framework, the Circularity Metrics Lab and the Corporate Sustainability Reporting Directive.

Another session of presentations focused on the activities implemented by LIPOR to boost circular economy among its municipalities and on the results of the HOOP project.

The second day was closed with a participatory session using Mentimeter to collect feedback from the participants.

A video summarising the event is available here.

9.3. Outcomes and impact

Participation: 32 people participated; 22 people received a certificate of participation as they followed the whole training. 11 among the participants were representatives of a member of the HOOP Network: Vila do Conde, Fornos de Algodres, Lisbon, Torres Vedras, Guimarães (Vitrus Ambiente), Porto Ambiente, Maiambiente.

Feedback of participants: As a general evaluation, although most of participants considered that the topics were interesting, they still have some difficulties seeing the applicability of the tools in their day-to-day jobs.

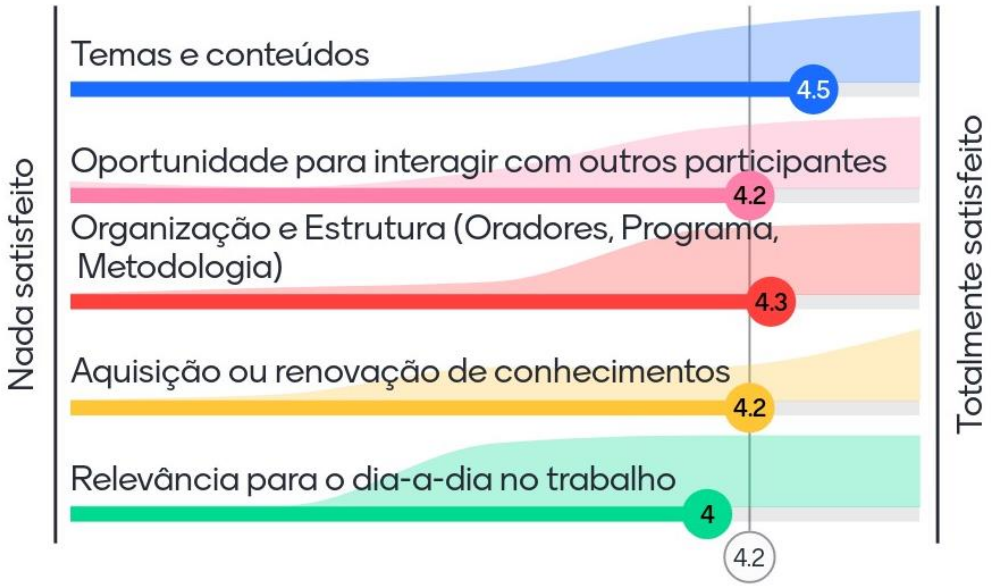

Figure 8. Satisfaction of participants on topics and contents; opportunity to interact with other participants; organisation and structure; acquisition and renewal of knowledge; relevance for day-to-day work.

Through Mentimeter, participants expressed their interest in getting a training on circular public procurement, sustainable events, partnerships, good practices at local level on biowaste and green spaces, and networking.

Regarding the tools and good practices presented, participants expressed a strong interest for:

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- *Citizens engagement and behavioural change (HOOP Trainers citizen science app)*
- *Stakeholders engagement (HOOP Biowaste Clubs)*
- *HOOP tools (Circularity Label, Hub, Virtual Academy, etc.)*
- *National policy framework and barriers*

Furthermore, the session investigated on additional stakeholders that could be included in the next training. Universities and research institutes have been indicated as key stakeholders to involve in the process.

Finally, a list of key words has been identified to describe the NRW organised by LIPOR: innovation, networking, sharing, knowledge, dynamic, sustainability, circularity, and clarity.

Figure 9. Words to describe the NRW organised by LIPOR.

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10. Western Macedonia

10.1. General information

Table 15. General information on National Replication Workshop Western Macedonia

Title of event	HOOP National Replication Workshop in Western Macedonia
Type of event	Workshop
Location	Thessaloniki, Greece
Date, duration	15/09/2023, 2 hours
Organisers, moderators	CluBE

10.2. Organisation and content

Goal: the workshop aimed to present the HOOP project, the achievement in the Western Macedonia Region, elements regarding stakeholder and citizen engagement, and promote the HOOP Network to recruit more Members in Greece.

Organisation and partners: CluBE organised the meeting on their booth during the 87th Thessaloniki's International Fair, a major event in Thessaloniki. This was done so to ensure a good participation, many Greek public authorities being present during the fair.

Agenda:

Table 16. Agenda of National Replication Workshop Western Macedonia

18:00 – 18:10	**Welcome**
18:10 – 18:40	The HOOP project
18:40 – 19:10	The lighthouse of Western Macedonia Region
19:10 – 19:30	Stakeholder and Citizens engagement

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19:30 – 19:45	HOOP Network of cities and regions
19:45 – 20:00	Q & A
20:00 – 20:30	Joining the HOOP network

Content of the discussion: the workshop started with a presentation that informed the participants on HOOP, its objectives and activities. After, CluBE presented the actions that they undertook as a HOOP Lighthouse, focusing on the stakeholder engagement and education, as well as on awareness raising activities to promote bioderived products. Finally, a presentation showing how different municipalities organised the collection and treatment of biowaste was given. The workshop was closed concluding that there is a lack of information regarding biowaste separation and, despite the National Law for Circular Economy forces the Greek municipalities to collect the biowaste, the interest is still very low. Participants were also invited to join the HOOP Network to benefit from the different services and pursue further exchanges.

10.3. Outcomes and impact

Participation: Around 15 people joined the event. Representatives from the cities of Kozani, Xanthi, Thessaloniki, Menemeni Kordelio, Eordaia and the Region of Central Macedonia, joined CluBE team to learn about Western Macedonia results within the project.

Outcomes: Greece experienced massive floodings on 14 September 2023, leading to the closure of road to access Thessaloniki, which impacted the participation to the fair and to the NRW. It was still possible to organise the event that brought together some Greek municipalities but the impact in terms of replication was reduced.

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11. Conclusions

The HOOP Lighthouses developed very different activities for their National Replication Workshop, reflecting different contexts and goals. Overall, the different events seem to have brought attention from different organisations at regional and national level. The lessons of the HOOP projects and the topic it addresses seem relevant to many local players, yet the discussions highlighted several challenges: the difficulty for local players and municipalities/local waste companies to consider innovation technologies and valorisation routes going beyond the existing, well-established recycling technologies, and the challenges in defining solid business models, making such biocircular solutions risky for investors. In this regard, public procurement for innovation might prove to be a useful instrument for public authorities, as demonstrated in Murcia.

Many National Replication Workshops also allowed Lighthouses to establish strong connections with other players, such as national authorities, fellow municipalities and waste management companies, or key players of the circular bioeconomy value-chain. Such connections are essential to secure the continuation of HOOP-related activities for all 8 Lighthouses.

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