UK Social Innovation Management for Bioplastics (SIMBIO)

Presentation SIMBIO Global Webinar

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SIMBIO
SOCIAL INNOVATION MANAGEMENT FOR BIOPLASTICS

UKRI Economic and Social Research Council

Coventry University

6th Jul 2022

Our Journey:

Research and preparation → **SIL 1: Seeing the system** → **SIL 2: Designing Solutions** → **SIL 3: Prototyping Solutions** → **Dissemination** → **Reporting**

Oct 2020	March 2021	June 2021	Nov 2021	Dec 2021	Jun 2022
Economic and Social Research Council 16 semi-structured Interviews stakeholders bioplastics					

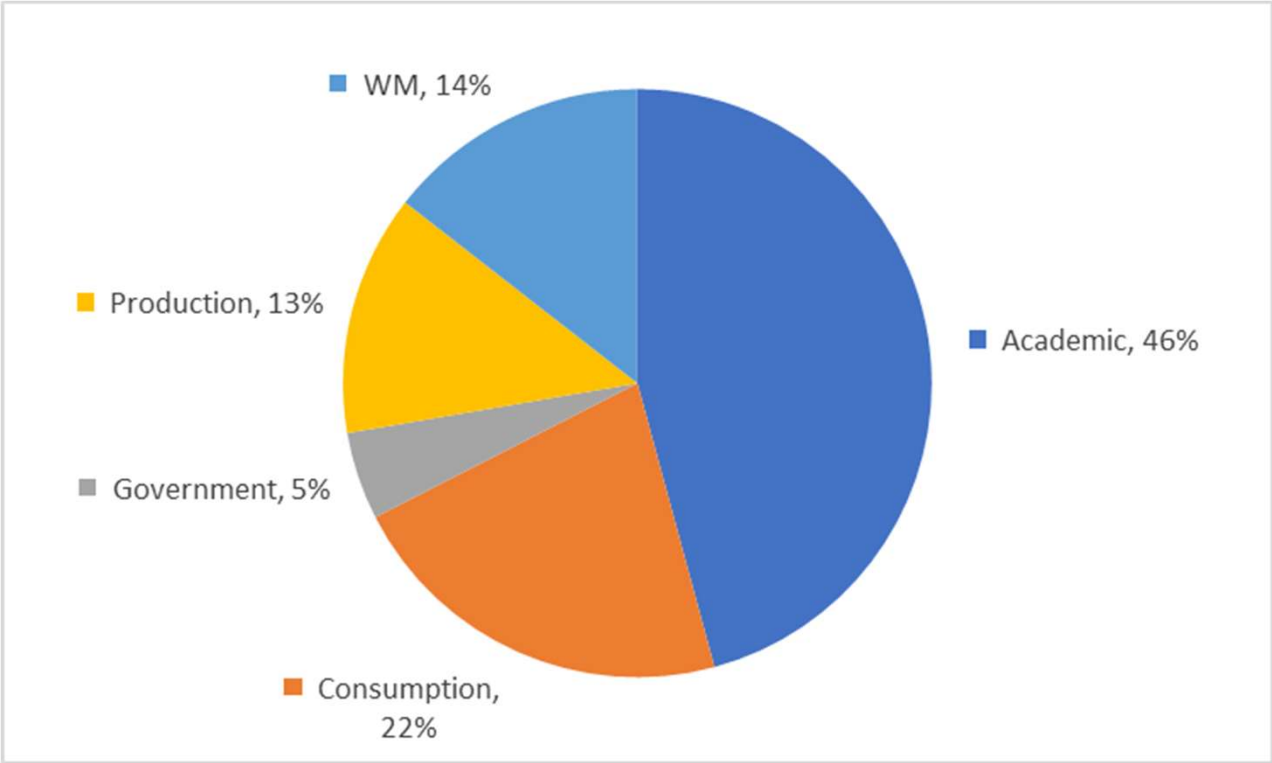
Biobased Biodegradable materials in the food packaging sector

Participants

N= 83

3 SIMBIO Labs

Oct 2021- Nov 2022



Outline

Social Innovation Lab 1 –

Seeing the System

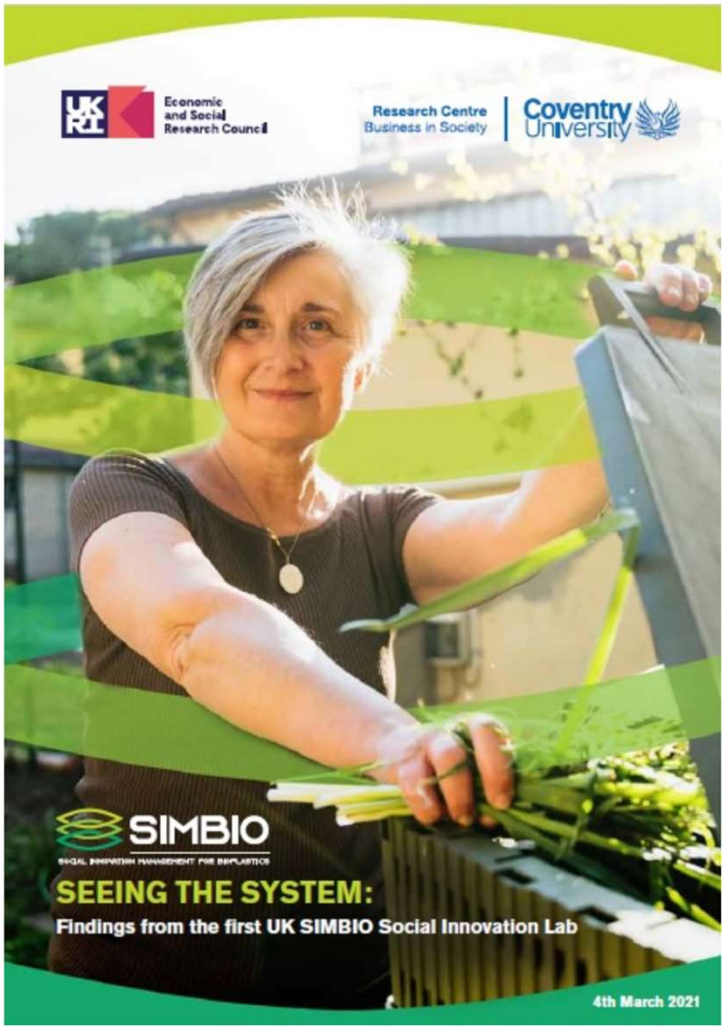
Social Innovation Lab 2 –

Designing Solutions

Social Innovation Lab 3 –

Prototyping Solutions

Final Recommendations



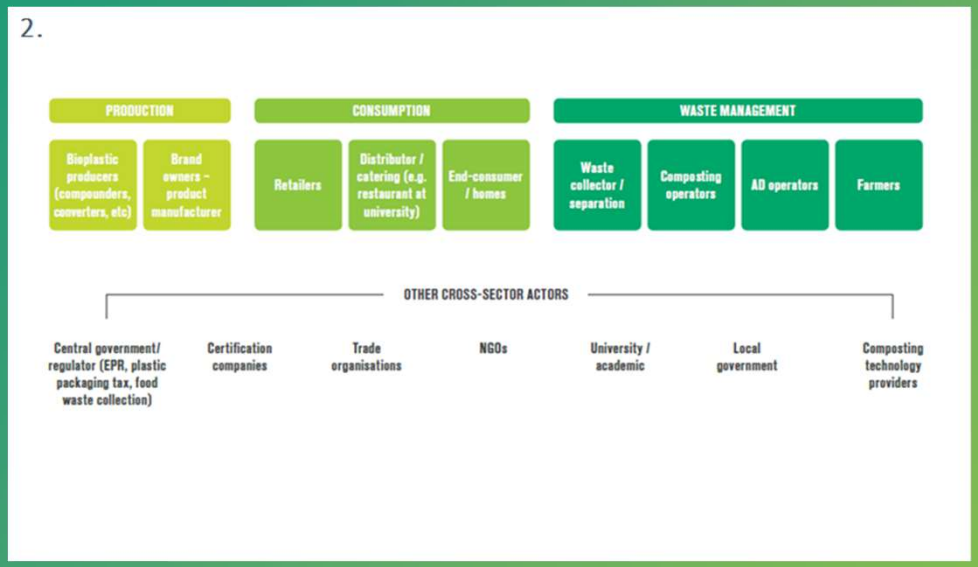
SIL 1: Seeing the System

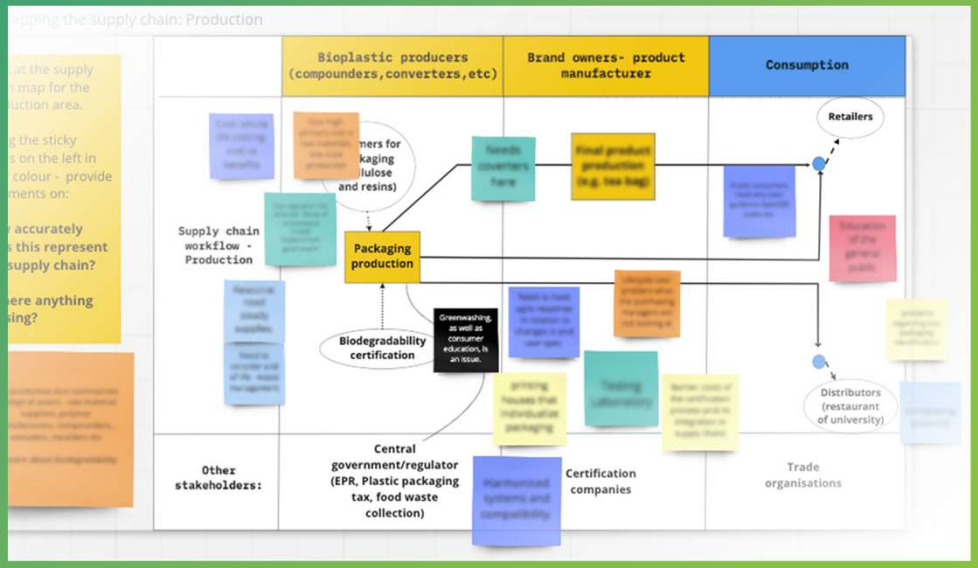
Objectives:

Obtain a consensus and clear understanding of the **current packaging supply chain** for bio-based biodegradable products.

Identify **barriers and opportunities** for achieving a more sustainable supply chain.

Obtain a clear understanding of the **future possibilities for a packaging supply chain** for bio-based biodegradable products.





SIL 1: Seeing the System

Task 1: Identifying your place in the system

Task 2: Seeing the system

Participants were shown a more detailed supply chain diagram and asked to comment on the actors present and their connections

Task 3: Barriers and opportunities for achieving growth

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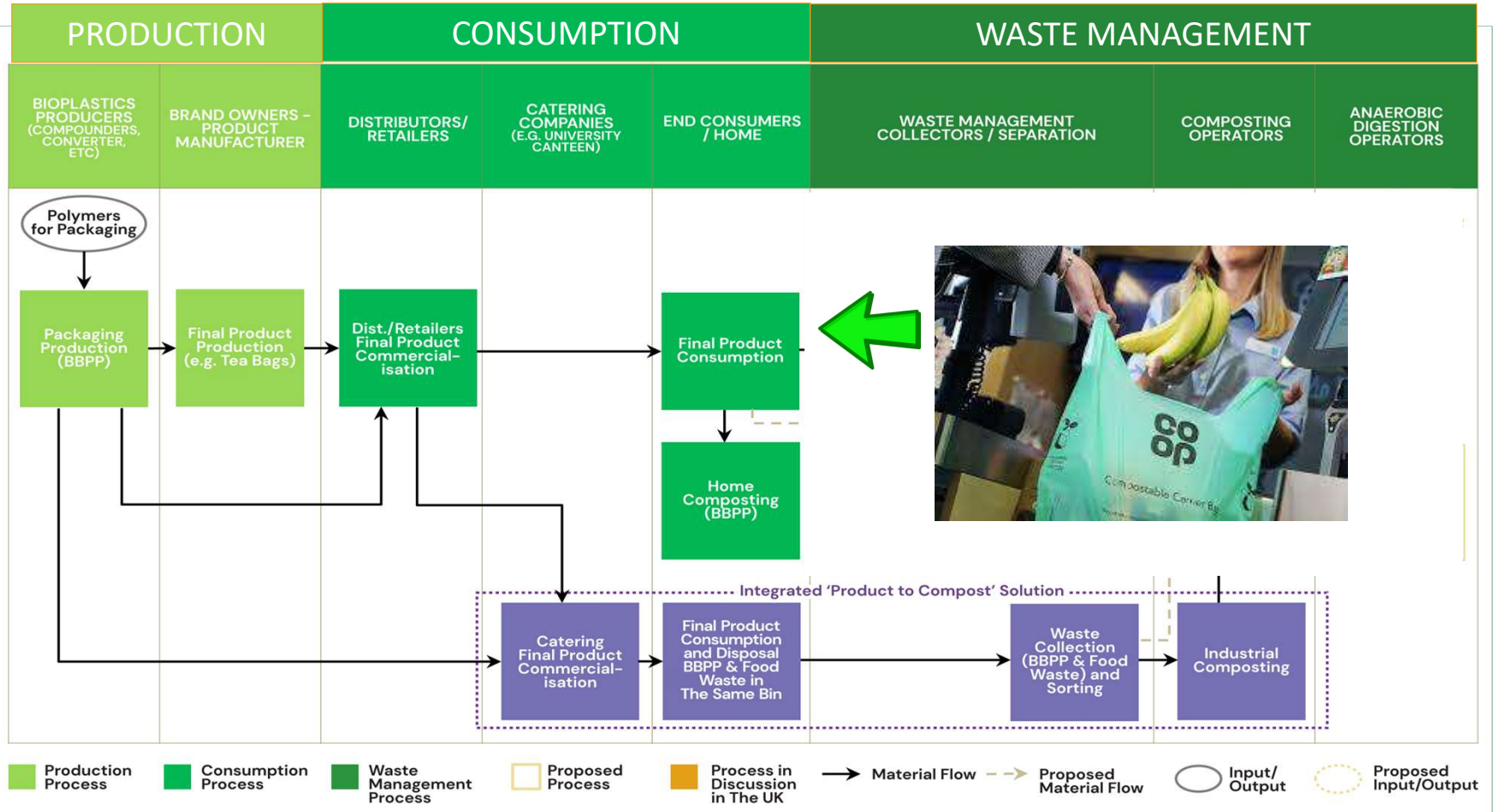
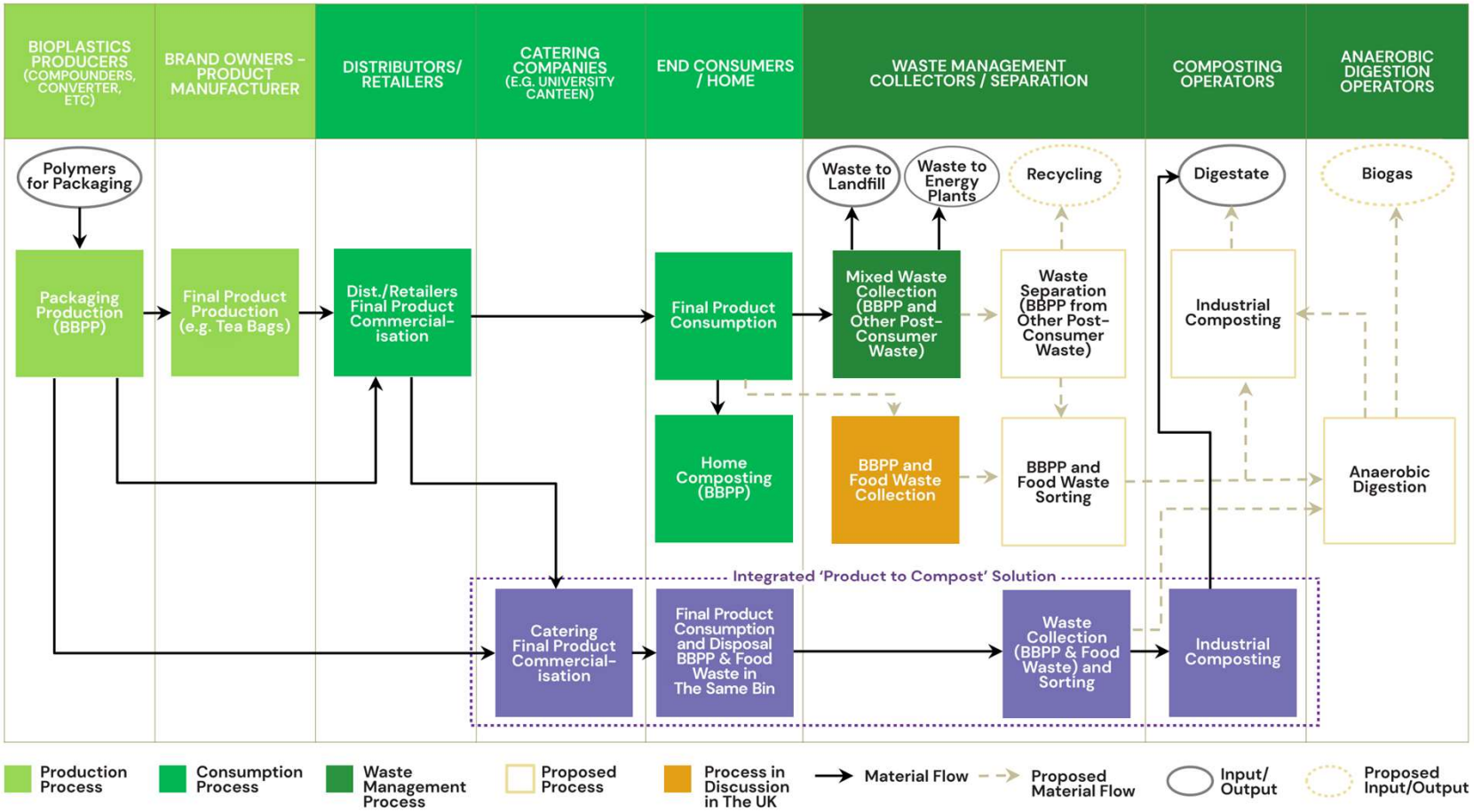

PRODUCTION
CONSUMPTION
WASTE MANAGEMENT
BIOPLASTICS PRODUCERS (COMPOUNDERS, CONVERTER, ETC)
BRAND OWNERS - PRODUCT MANUFACTURER
DISTRIBUTORS/ RETAILERS
CATERING COMPANIES (E.G. UNIVERSITY CANTEEN)
END CONSUMERS / HOME
WASTE MANAGEMENT COLLECTORS / SEPARATION
COMPOSTING OPERATORS
ANAEROBIC DIGESTION OPERATORS
Polymers for Packaging
Packaging Production (BBPP)
Final Product Production (e.g. Tea Bags)
Dist./Retailers Final Product Commercial-isation
Final Product Consumption
Home Composting (BBPP)
Integrated 'Product to Compost' Solution
Catering Final Product Commercial-isation
Final Product Consumption and Disposal BBPP & Food Waste in The Same Bin
Waste Collection (BBPP & Food Waste) and Sorting
Industrial Composting
Production Process
Consumption Process
Waste Management Process
Proposed Process
Process in Discussion in The UK
Material Flow
Proposed Material Flow
Input/ Output
Proposed Input/Output

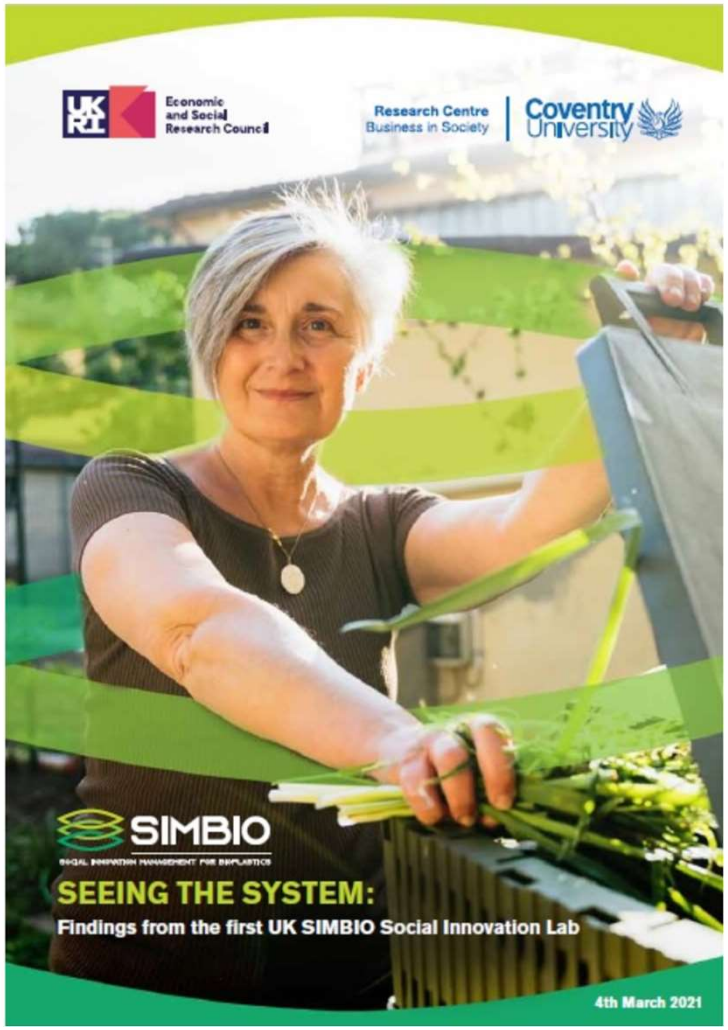
co op

BIOBASED BIODEGRADABLE PLASTICS PACKAGING SUPPLY CHAIN



Ten recommendations for Social Innovation Lab 2

- Develop **clear and consistent** legally binding **labelling**
- Develop **clear guidelines for processing compostable plastics** waste
- Enforce current **certification standards**
- Connect the **current certification standards** with a **compatible labelling system** and procedures
- Develop **clear and consistent terminologies**
- Develop **educational programmes** for home composting biodegradable products.
- **Dedicated use of compostable products** for applications that are difficult to recycle.
- Develop **infrastructure for disposing of compostable materials at industrial levels**.
- **R&D of other feedstocks,** for example, from waste
- **Adopt consistent policies** to support the use of compostable plastics.



Ten recommendations summarised in 6 clusters

1

Communicati on with the consumers

2

Educational programs

3

Certification standards and guidelines

4

Specific products and more feedstocks

5

End of life (the end-of-life phase starts when the consumer disposes of the compostable packaging)

6

Policies

SIL 2: Designing Solutions

Objectives:

Identify **promising solutions** for rapid prototyping

Explore **future pathways** for improving the sustainable **uptake** of bioplastic packaging

Obtain a **clear understanding** of the future possibilities for a packaging supply chain for bio-based biodegradable products

SIL 2: Designing the System

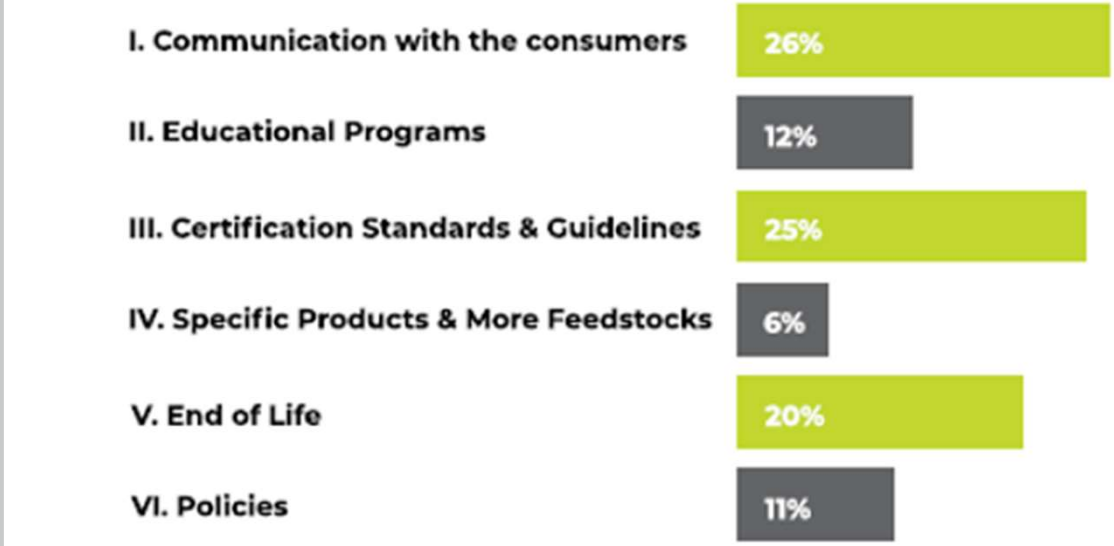
Task 1:

Which solutions should be prioritised?

Task 2:

How might these solutions play out over the next 10 years?

Mentimeter



Findings

SIL 2

Communication with consumers

- Reduction in the complexity of the messaging
- Correct identification of bioplastic and appropriate disposal action
- Easy to read labelling critical

Certification standards and guidelines

- Regulatory tools for waste management
- Definition of minimum requirements and processing procedures to follow
- A logo that communicates compliance - EN13432, OK compost, TUV Austria, Seedling logo

End-of-life

- Evidence that bioplastics can completely degrade
- Appropriate infrastructure in the UK to accept bioplastics unless the compostable plastics (biobased biodegradable) packaging is commercialised through closed-loop systems.

SIL 3: Prototyping solutions

Objectives:

Test and prototype solutions within the social innovation lab “container”

Evaluate the **feasibility, practicality, and potential** impacts of solutions

Identify and assess **promising solutions** for field prototyping

SIL 3: Prototyping Solutions

Task 1:

Components of the solutions by experts

Task 2:

Feasibility and viability of solutions:

- Specifics products, end-of-life solutions, policies and certification standards.

Task 3:

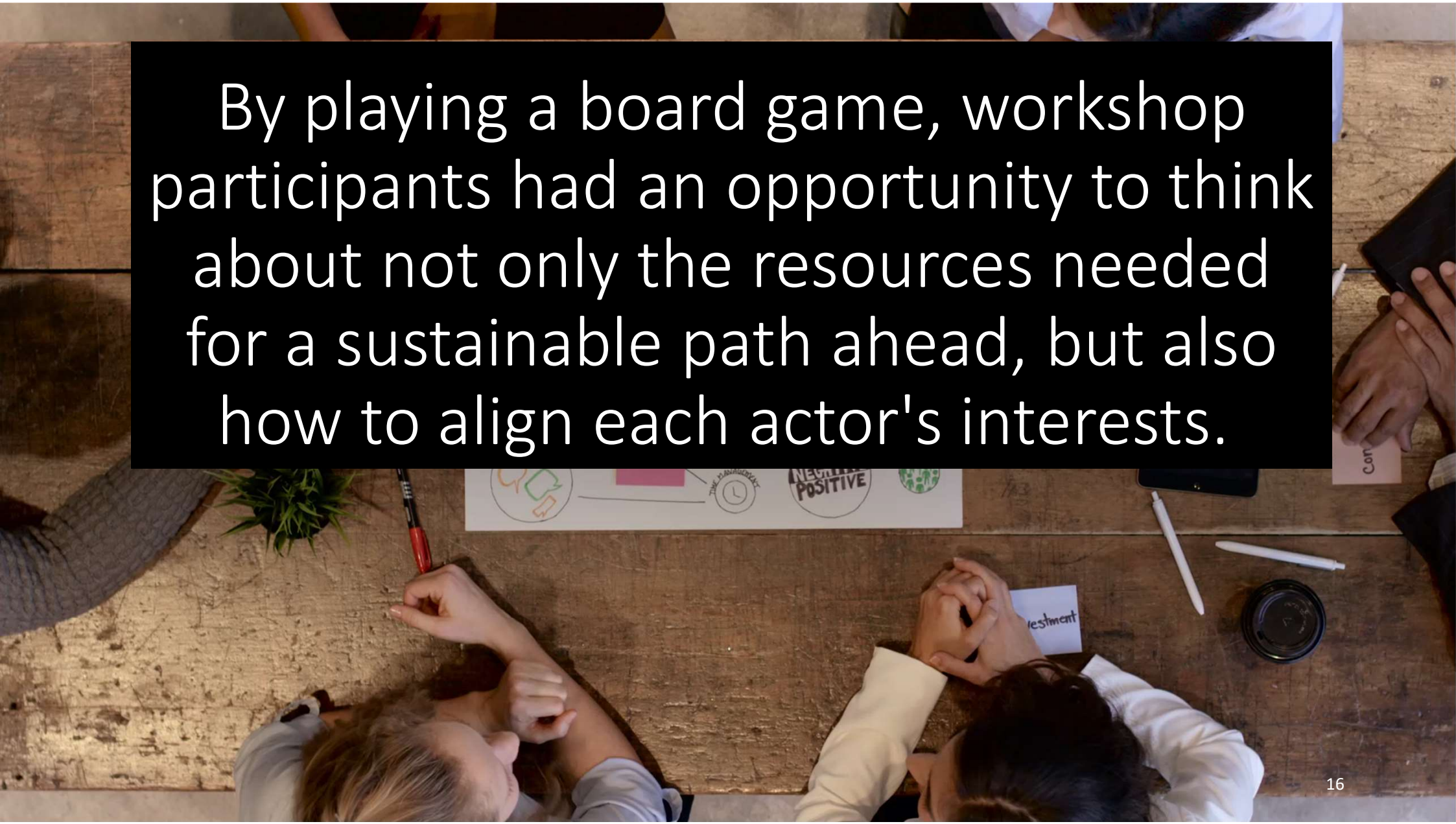
Prototyping solutions for specific products

- Hybrid workshop (online/onsite)
- Gamification tools

Compostable ready meal tray

Compostable food caddy liner


Compostable coffee pods



By playing a board game, workshop participants had an opportunity to think about not only the resources needed for a sustainable path ahead, but also how to align each actor's interests.

Compostable Food caddy liner

“bridge technology”

bio-paper caddy liners derived from cellulose (paper materials) or a mix of cellulose and other biodegradable biobased materials

Consumers will easily differentiate them, tackling one of the main problems today of bioplastics materials

They may penetrate the market faster and contribute to the consumers’ behaviour change

Allow certification standards and waste management process evolution to include a wider spectrum of compostable packaging

Climate change crisis

More urgency to the downstream processes is needed
e.g. anaerobic digestion, industrial composting and the collection of bio-paper food caddy liners and food waste, ensuring that the liners and processes reduce the CO2 emissions, supported by carbon reporting by 2025

Findings

SIL 3

Cooperation

- Brands play a key role and is critical for closed-loop recycling systems to be implemented, given the connection between retailer and waste management.
- Solve contamination at the end of life underpinned by CE principles.

Consumer focus

- Only focusing on product development is insufficient as an isolated solution.
- Consideration is needed of wider consumer behaviour. E.g. bridge technology

Certification

- Regulation needed to facilitate the implementation of certification.
- Need for pressure to ensure businesses abide by certification commitments

Compostable ready meal tray

Compostable food caddy liner


Compostable coffee pods

Cost

- Cost is a major barrier, given that brands need to invest in the development of new bioplastic materials to expand their use.

The SIMBIO project has shown **how collaboration through a social innovation** approach can make a significant contribution to understanding and overcoming the challenges facing the future sustainability of the biobased biodegradable packaging sector in the UK

Solutions must integrate communication with consumers, end-of-life, policies, certification standards and labelling, education and development of specific products

Recommendations

1. Expand R&D investments to:
    - **produce products that are alternative** to hard-to-recycle plastics, prone to contamination or that provide extra environmental benefits over other materials.
    - continue evidencing the **sustainability of biobased biodegradable products, looking at the life cycle**

2. Greater **investment** in **industrial composting and anaerobic digestion (e.g. dry anaerobic digestion, with a composting phase, and/or wet AD).**
3. Create **disposal** and **collection routes** for biobased biodegradable products
4. **Greater accountability** and collaboration to implement **certification standards** that align with product labelling and WM procedures
5. Comprehensive **recycling marketing strategy** that includes different actors and at various supply chain stages

6. Development of a **policy framework**, including the sourcing, labelling, disposal and processing at the end-of-life.

7. **Educational programmes** focused on removing consumer confusion from labelling, and providing memorable advice to encourage the right end-of-life procedure.

8. Develop educational programmes aimed at **home composters.**

More information:

Information for the project: https://www.simbioresearch.com/

Reports:
https://www.simbioresearch.com/seeing-the-system-report-uk-report/
https://www.simbioresearch.com/designing-solutions-report-uk/

Technical information from the BBIA:
https://www.simbioresearch.com/an-explanation-of-biodegradable-and-compostable-polymer-materials-from-the-bbia/

Transition to Bioeconomy: https://www.mdpi.com/2071-1050/13/7/3896

Food Plastic Packaging Transition towards Circular Bioeconomy: A Systematic Review of Literature