



SUSTAINABILITY OF FOOD PACKAGING: A MULTIDISCIPLINARY APPROACH

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SHAPING THE FUTURE WITH PACKAGING

9th & 10th of March 2023

PACK4FOOD

STRATEGY



-  RESEARCH
-  TRAINING
-  ADVICE
-  PUBLICATIONS
-  NETWORK



PACK4FOOD - MEMBERS

JOIN US!

MEMBER OF THE NETWORK
Pack4Food



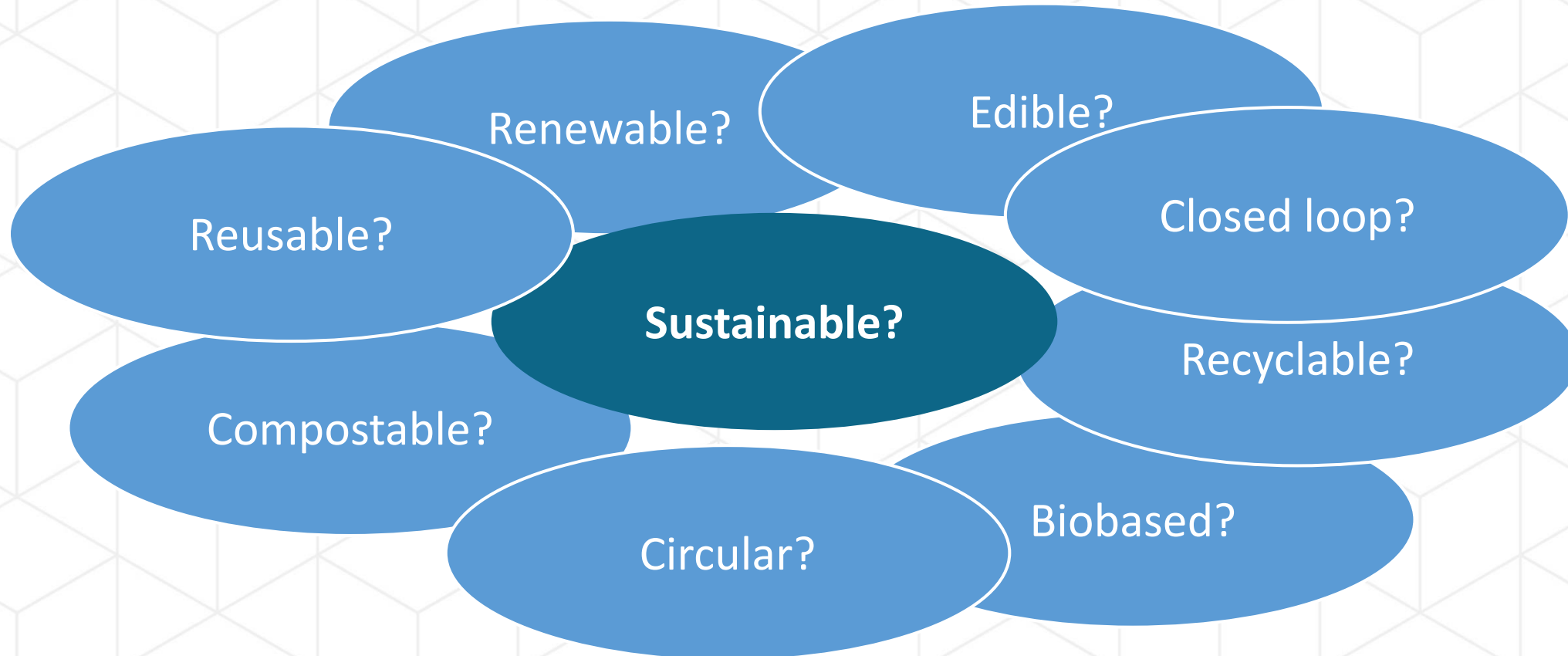
RESEARCH CENTERS & OTHERS



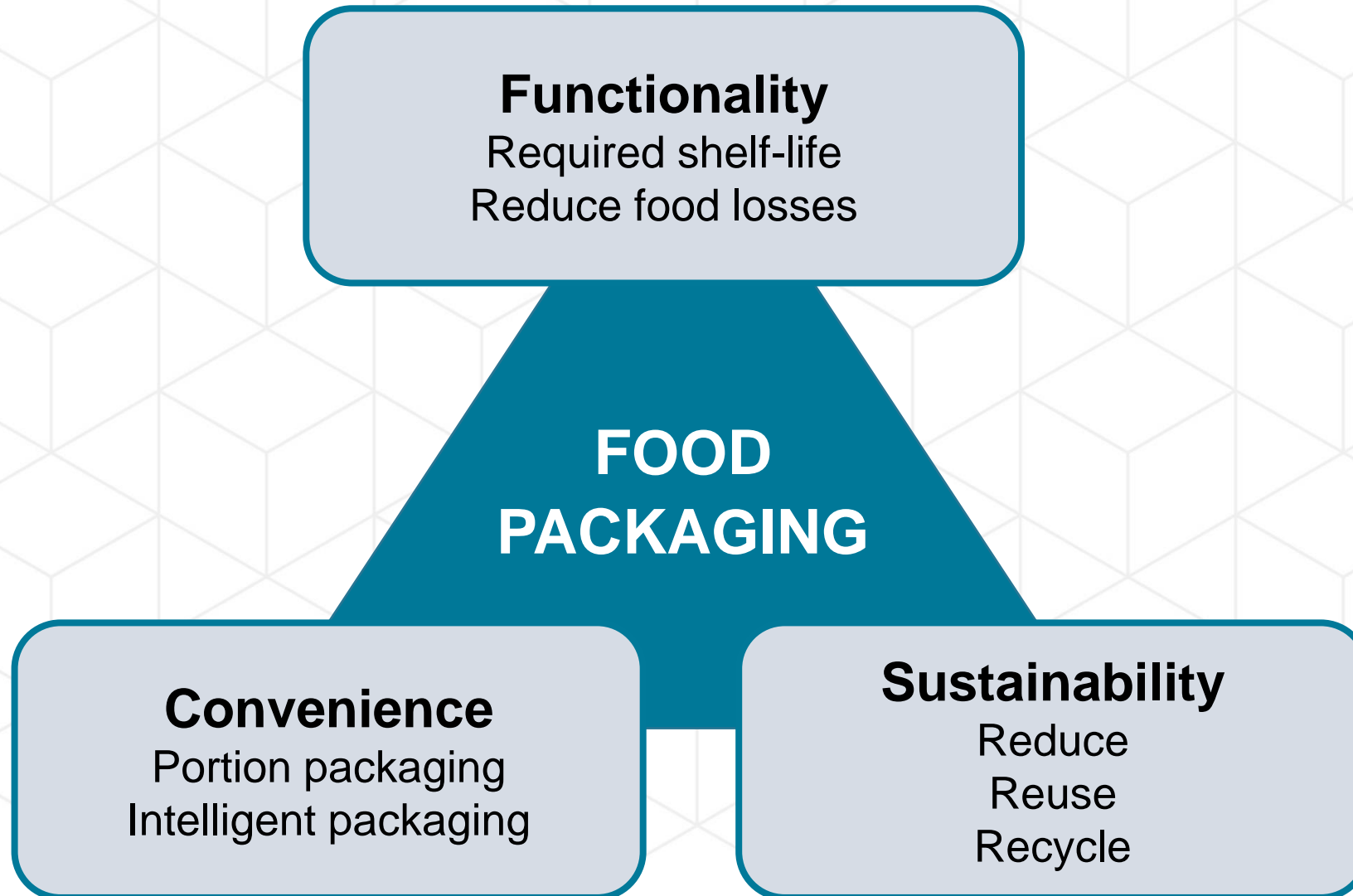
SAMEN MAKEN WE MORGEN MOOIER



SUSTAINABILITY IN FOOD PACKAGING?



PACKAGING IS



MAIN DRIVERS IN PACKAGING INNOVATION



Circular Economy Action Plan

The European Green Deal

Proposal Packaging & Packaging Waste Regulation

EU Single-use Plastics Directive

EU ban on plastic waste exports



CEFLEX
A CIRCULAR ECONOMY FOR FLEXIBLE PACKAGING

Flexible plastic, metal & paper packaging

RecyClass™

Rigid & flexible plastic packaging



Fibre-based packaging



PACKAGING IS



Functionality
Required shelf-life
Reduce food losses

**FOOD
PACKAGING**

Convenience
Portion packaging
Intelligent packaging

Sustainability
Reduce
Reuse
Recycle



**Changes in
packaging
composition**



PACKAGING - SUSTAINABILITY



Key message 1: always consider the packaged product
i.e. product + package

PACKAGING - FUNCTIONALITY

DELICIOUS & HEALTHY FOODS

- ▶ Mild preservation technology
- ▶ Less use of additives
- ▶ Reduction in fat, sugar and salt content
- ▶ Globalisation

Stability of food products?



**Importance
packaging!**

- Multilayer packaging
 - Combination of different materials
 - E.g. paperboard-aluminium-plastics
 - Combination of different layers
 - E.g. different plastic layers

PACKAGING - FUNCTIONALITY

DELICIOUS & HEALTHY FOODS

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Stability of food products?



**Importance
packaging!**

- Multilayer packaging
- Modified atmosphere packaging (MAP)
+ increase in cold storage shelf-life

PACKAGING - FUNCTIONALITY

DELICIOUS & HEALTHY

▶ MAP: example of gas mixtures

Product	O ₂ (%)	CO ₂ (%)	N ₂ (%)
Fresh red meat	70	30	/
Cured meat	0	30	70
Lean fish	30	40	30
Fatty fish	0	60	40
Lettuce	2	5	Equilibrium
Bake-off bread	0	60	40
Cakes	0	60	40
Lasagne	0	70	30
Potato chips	0	0	100

Multilayer packaging needed

Sliced cooked ham

- Under air: max. 5 days shelf-life
- Under MAP: max. 4 weeks shelf-life

PACKAGING - FUNCTIONALITY

DELICIOUS & HEALTHY

▶ MAP: example of gas mixtures

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Multilayer packaging needed

Example packaging materials

“conventional”

- Tray: PET/PE
- Topfoil: PA/PE/EVOH/PE

“alternative”

- Tray: PET
- Topfoil: PET/SiOx/PET

PACKAGING - SUSTAINABILITY



Key message 1: always consider the packaged product
i.e. product + package



Key message 2: aim for packaging optimization

PACKAGING - SUSTAINABILITY

Eco-design

Remove

- Remove 'unnecessary' packaging components

Reduce

- Reduce thickness
- Reduce number of layers

Re-use

- Re-use of bags, jars, trays,...

Recycle

- Use recyclable materials (e.g. monolayer)
- Use recycled content (e.g. rPET, rPP)

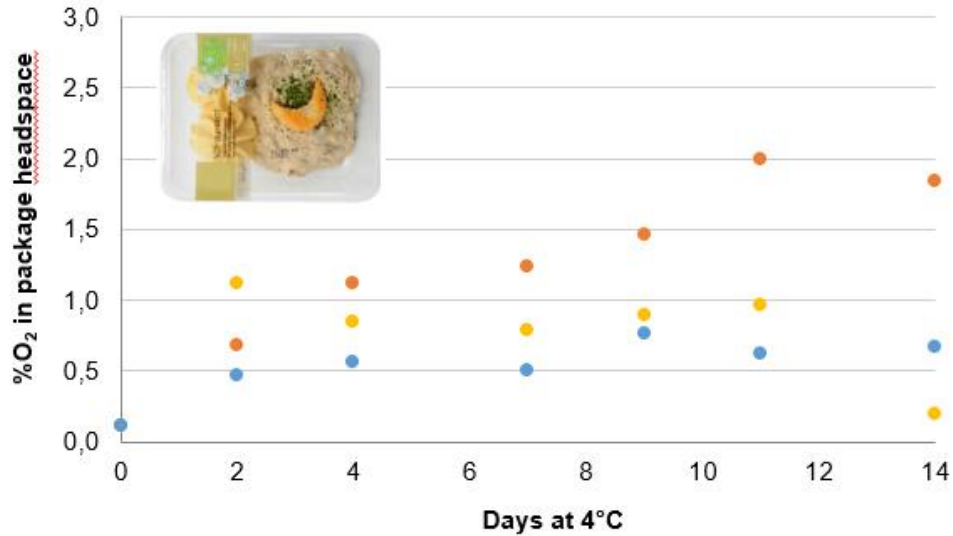
Renewable

- Biobased plastics
- Fibre-based (including cardboard, bagasse,...)

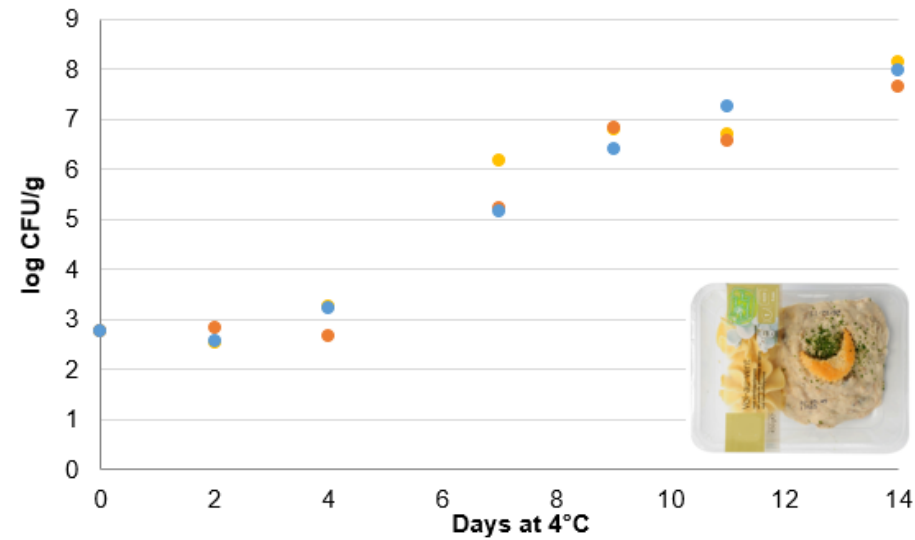
OPTIBARRIER

SHORT SHELF LIFE FOOD PRODUCTS

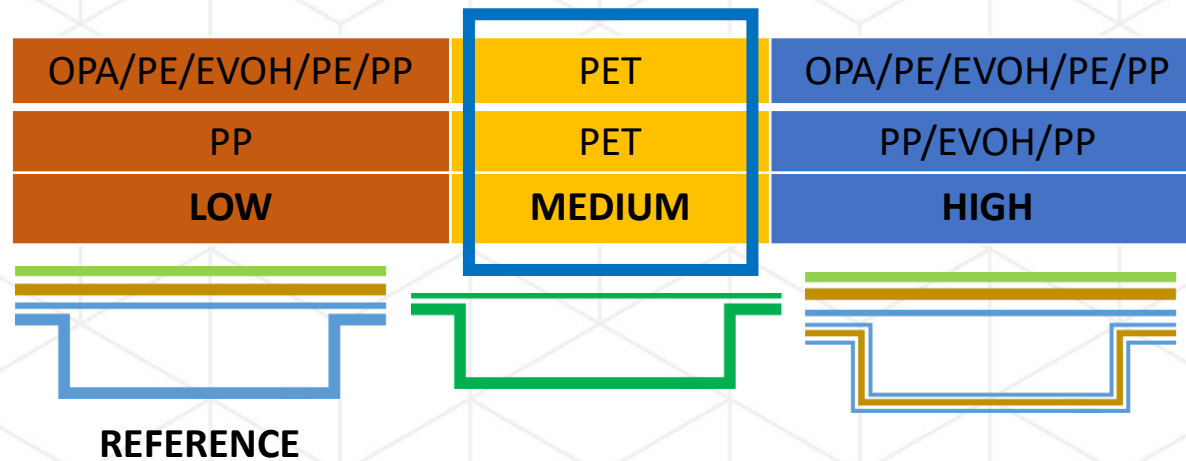
OXYGEN



LACTIC ACID BACTERIA



Top foil
Tray
O₂ Barrier



Project partners

Coordinator 

 GHENT UNIVERSITY

 IMEC

 chem

 MPR&S
Materials and Packaging Research & Services

 UHASSELT

 KU LEUVEN

 LABORATORIUM VOOR LICHTTECHNOLOGIE

 IBE-BVI



PACKAGING - SUSTAINABILITY

Eco-design

Remove

- Remove 'unnecessary' packaging components

Reduce

- Reduce thickness
- Foamed structures

Re-use

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VISION2REUSE

2022-2023: EFRO



EFRO
EUROPEES FONDS
VOOR REGIONALE
ONTWIKKELING



Europese Unie

Mede gefinancierd
in het kader van de
respons van de Unie op
de COVID-19-pandemie

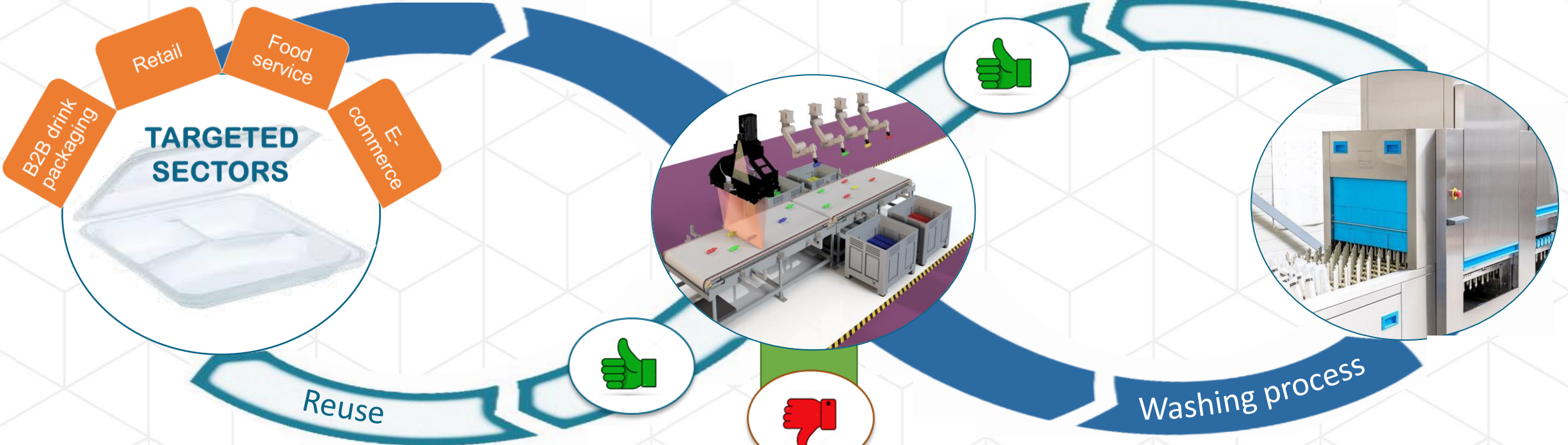


Fevia
Vlaanderen

comeos



SAMEN MAKEN WE
MORGEN MOOIER
OVAM



Project partners

Coordinator

AGENTSCHAP INNOVEREN & ONDERNEMEN

FF FLANDERS' FOOD

samen voor #sterkgroeien

Imec

Pack4Food



PACKAGING - SUSTAINABILITY

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GLOPACK

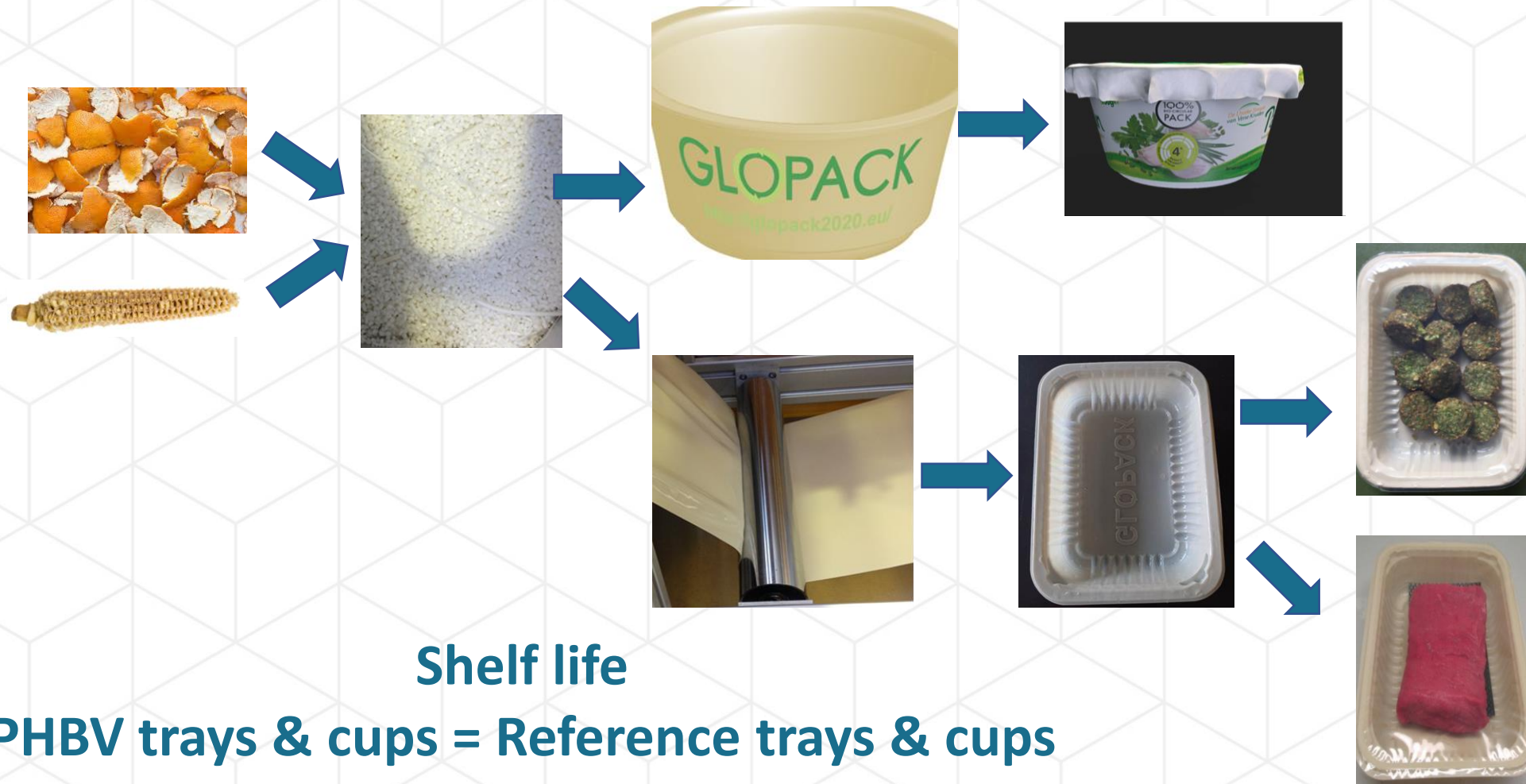
2018-2021

- ▶ EU H2020-project
- ▶ Coordinated by University Montpellier
- ▶ Focus on PHBV
- ▶ Including active and intelligent components



GLOPACK

2018-2021



Shelf life

PHBV trays & cups = Reference trays & cups

<http://glopack2020.eu/>

Pack4Food
members:

LA VIE
est
BELLE

COLRUYT
GROUP


Pack4Food

PACKAGING - SUSTAINABILITY



Key message 1: always consider the packaged product
i.e. product + package



Key message 2: aim for packaging optimization
Responsibility of all stakeholders in packaging chain!



Key message 3: recycling = collection, sorting and recycling

COLLECTION – SORTING - RECYCLING

CFR. PROPOSAL PPWR



What is recyclability?

1. Designed for recycling (cfr. design-for-recycling guidelines)
2. Effectively and efficiently separately **collected**
3. **Sorted** into defined waste streams without affecting the recyclability of other waste streams
4. Can be **recycled** so that the resulting secondary raw materials are of sufficient quality to substitute the primary raw materials
5. Can be recycled at scale (by 1st of January 2035)

COLLECTION – SORTING - RECYCLING

- ▶ Collection
 - ▶ Worldwide approach urgently needed
 - ▶ Deposit Return Schemes
- ▶ Sorting
 - ▶ Digital watermarking
 - ▶ Artificial intelligence
- ▶ Recycling
 - ▶ Mechanical and chemical recycling
 - ▶ More recycling infrastructure needed

ROADMAP: FOOD PACKAGING OF THE FUTURE



EUROPEAN COLLABORATION PLATFORM ON FOOD PACKAGING

20 CLUSTERS – 11 EU COUNTRIES

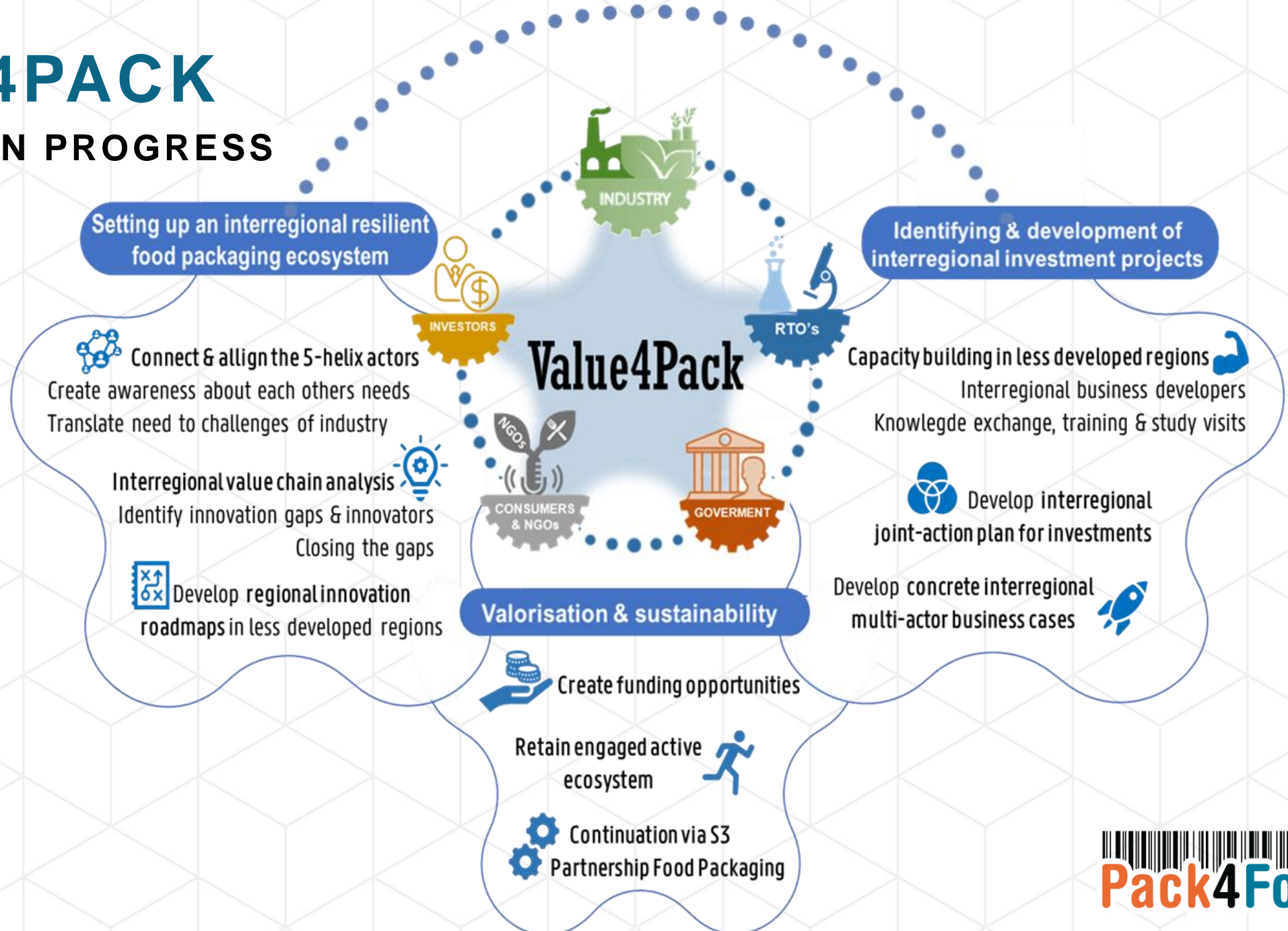
LEAD:
LEADING PARTNER:
CO-LEAD:

PACK4FOOD
FLANDERS' FOOD
NATUREEF




VALUE4PACK

PROPOSAL IN PROGRESS




Setting up an interregional resilient food packaging ecosystem

 Connect & allign the 5-helix actors
Create awareness about each others needs
Translate need to challenges of industry

Interregional value chain analysis 
Identify innovation gaps & innovators
Closing the gaps

 Develop regional innovation roadmaps in less developed regions

Identifying & development of interregional investment projects

Capacity building in less developed regions 
Interregional business developers
Knowlegde exchange, training & study visits

 Develop interregional joint-action plan for investments

Develop concrete interregional multi-actor business cases 

Valorisation & sustainability

 Create funding opportunities

Retain engaged active ecosystem 

 Continuation via S3 Partnership Food Packaging

Advanced Master of science in

sustainable food packaging

“to facilitate a switch towards 100% reusable, recyclable, compostable or biodegradable packaging, and prepare students to become **experts in sustainable food packaging systems**”

- Start: September 2022
- Ghent University Campus Kortrijk
- Unique in Europe
- 3 types of students as target audience:
 1. recent graduates
 2. international students
 3. professionals

NEW!



Programme (60 ECTS)

www.sfp.ugent.be

- English
- Mix between on campus and online or hybrid educational activities
- Modular

Module 1	Module 2	Module 3	Module 4	Module 5
Sept – Oct – Nov	Nov – Dec – Jan	Feb - Mar	Apr - May	Deadline: mid-June
Sustainability in food systems (5 ECTS)	Food packaging economics & management (4 ECTS)	Food safety of packaging materials (3 ECTS)	Food packaging design (5 ECTS)	Master's dissertation (15 ECTS)
Food packaging systems: materials, machines and packaging conditions (7 ECTS)	Shelf-life of packed foods (7 ECTS)	End-of-life management of packaging (5 ECTS)	Comparative sustainability analysis of food packaging - Case studies (5 ECTS)	
		Quality management in food packaging (4 ECTS)		

THANK YOU FOR YOUR ATTENTION



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