

RIGA MEETING, 5-6 JUNE 2018

ROADMAPPING WORKSHOP

COST FP1405

ACTIVE AND INTELLIGENT FIBRE-BASED PACKAGING - INNOVATION AND MARKET INTRODUCTION





COST is supported by the EU Framework Programme Horizon 2020

GOAL OF THE WORKSHOP

Develop roadmaps for bringing Active & Intelligent packaging to the market

→ Building on the work of previous WG meetings

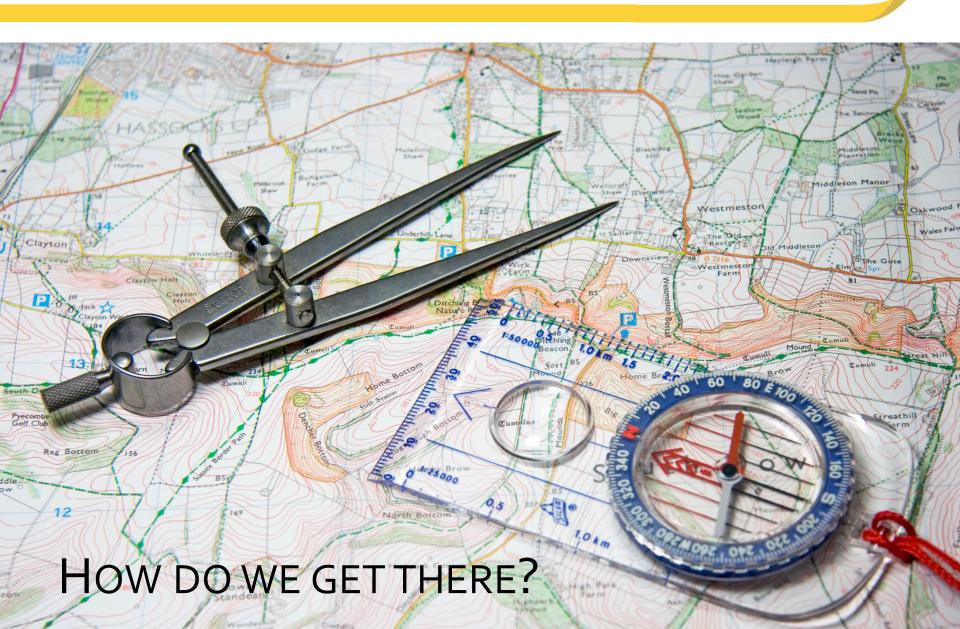
ROADMAPS?



ROADMAPS?



ROADMAPS?



TECHNICAL CHALLENGES - ACTIVE

active component

integration in packaging

packaging process

logistic

end of life

active component

- •organoleptic properties
- product availability

integration in packaging

- activity: integration in polymer films vs.
 sachet application
- •active agent has to survive processing (e.g. extrusion): pressure, temperature, pH, loss of volatile agents, interaction with other materials → What is the suitable production/integration method?

packaging process

- •selection of suitable format/volume of active packaging and amount of food
- deactivation or interaction with food

logistic

- Storability
- influence of storage conditions on activity (temp sensitivity, humidity, different climates)
- shelf life of active packaging material? (time stability)

end of life

- •recyclability? recovery of the product?
- •What do we know about long-term impact of the AP?

TECHNICAL CHALLENGES - INTELLIGENT

intelligent technology integration in packaging

packaging process

logistic

end of life

intelligent technology

- General
 - Reliability → hudge problem
- RFID
 - printing technology → extra process
 → more cost
- Sensor-based systems
- Reliability of sensors/ coupling / connection difficulties (e.g. sensor& RFID combination)

integration in packaging

- General
 - extra processing step required → costly
- RFID (+ sensor enabled)
 - printing development, challenges in printing
- Sensor-based systems
 - inside vs. external

packaging process

- General
- Printed on a seperate tag, extra step required
- RFID
 - anticounterfeiting
- Sensor-based systems
 - TTI: high variety: choose the right technology

logistic

- RFID (+ sensor enabled)
 - reading system and network required
- Sensor-based systems
- Sensitivity of the products.

end of life

 recyclability: hudge problem for IP systems

SOCIO-ECONOMIC CHALLENGES

Active component producer

Packaging producer

Packer/ **Brand owner**

Retailer

Consumer / **End User**

Waste collector/ processor / recycler

Costs vs revenues

- Customer willingness to pay
- Return of investment unclear

Dependency

 Packaging machines dictate properties / behaviour of components

Flexibility

- Willingness to produce
- Batch / production size
- Market readiness

Legislation

Complex matter

Sustainability

Awareness

- Possibilities
- Potential benefits

Costs vs revenues

- Willingness to pay for A&I component
- Customer willingness to pay
- Return of investment unclear

Flexibility

- Willingness to produce
- Batch / production size
- Market readiness

Legislation

Complex matter

Sustainability

Awareness

- Possibilities
- Potential benefits (eq sustainability, ...)

Legislation

Food safety

Costs vs revenues

- Willingness to pay
- Customer willingness to pay
- Return of investment unclear

Flexibility

- Willingness to produce
- Batch / production size
- Market readiness

Awareness

- Possibilities
- Potential benefits (eq sustainability, ...)

Costs vs revenues

- Willingness to pay
- Customer willingness to
- Return of investment unclear
- •Indicators might cause product losses (i.e. consumers always buving the freshest)

Transparancy

 Desire to control freshness without showing the consumer

Trust

In technology

Reliability

• Who is liable?

Awareness

- What is it?
- Possibilities
- Benefits

Trust

- Is it safe and healthy?
- Visible vs invisible
- Will consumers rely on indicators?
- Will consumer still use its own senses or blind faith in technology?

Perception

- Freshness-perception vs extended shelf-life
- Active parts considered 'additives' =undesired

Way of communication

- Stay positive
- Addressing different consumer groups (geography, age, education)

Costs vs revenues

- Willingness to pay (how much?)
- Benefits: amount of shelf-life extension. second shelf-life, reduction of food losses. etc.

Sustainability: food loss vs AIP

CREATIVE PROCESS

	Short-term (Now - 2019)			Visionary
Market Drivers	-	o or change somethir orne illnesses, huge produ		
Solutions	What should I do, a e.g. reduce food waste,		about quality and safety, e	etc.
Enabling Technologies	How can I do it? e.g. antimicrobial packa	ging, TTI's, NFC technolog	gy, etc.	
Resources		capabilities do I need test panel, microbiology k		

CREATIVE PROCESS

	Short-term (Now - 2019)	Mid-term (2020 - 2022)	Long-term (2023 - 2025)	Visionary
Market Drivers	2. Summarize key drivers, constraints & assumptions		1.	Clarify
Solutions		4. Use roadma		objectives
Enabling Technologies	3. Summarize current situation	road forwar		
Resources			decision po knowledge	ints &

	Short-term (Now - 2019)	Mid-term (2020 - 2022)	Long-term (2023 - 2025)	Visionary
Market Drivers			1.	Clarify
Solutions				objectives
Enabling Technologies				
Resources				

	Short-term (Now - 2019)	Mid-term (2020 - 2022)	Long-term (2023 - 2025)	Visionary
Market Drivers	2. Summarize key drivers, constraints & assumptions			Active & Intelligent packaging is appreciated and used by all consumers
Solutions				Consumers trust AIP is safe, reliable and useful
Enabling Technologies				
Resources				

	Short-term (Now - 2019)	Mid-term (2020 - 2022)	Long-term (2023 - 2025)	Visionary
Market Drivers	- Consumers don't know what AIP is and what its benefits are - Lack of trust in safety & reliability of AIP - Too long shelf life ≠ fresh			Active & Intelligent packaging is appreciated and used by all consumers
Solutions	3. Summarize current situation			Consumers trust AIP is safe, reliable and useful
Enabling Technologies				
Resources				

	Short-term (Now - 2019)	Mid-term (2020 - 2022)	Long-term (2023 - 2025)	Visionary
Market Drivers	- Consumers don't know what AIP is and what its benefits are - Lack of trust in safety & reliability of AIP - Too long shelf life ≠ fresh			Active & Intelligent packaging is appreciated and used by all consumers
Solutions	- Research how to communicate with consumers effectively - Inform consumers about AIP + benefits - Tryout campaigns (cashback)	4 • Use roadma		Consumers trust AIP is safe, reliable and useful
Enabling Technologies	- Information flyers/leaflets/ videos/articles - Communication space on packaging - AIP technologies	road forwar	•	
Resources	- Social scientists - Channels to communicate with consumers - Marketing budget - Designers - Accepting legislation			

	Short-term (Now - 2019)	Mid-term (2020 - 2022)	Long-term (2023 - 2025)	Visionary	
Market Drivers	 Consumers don't know what AIP is and what its benefits are Lack of trust in safety & reliability of AIP Too long shelf life ≠ fresh 			Active & Intelligent packaging is appreciated and used by all consumers	
Solutions	- Research how to communicate with consumers effectively - Inform consumers about AIP + benefits - Tryout campaigns (cashback)	 - Launch new AIP as supporting technology - Inform consumers about AIP + benefits - Tryout campaigns (cashback) 	- Evaluate consumer readiness for launching AIP as primary technology - Launch new AIP as primary technology (if market is ready)	Consumers trust AIP is safe, reliable and useful	
Enabling Technologies	•	 Information flyers/leaflets/ videos/articles Communication space on packaging AIP technologies 	5 Highlight ke		
Resources	•	 Social scientists Channels to communicate with consumers Marketing budget Designers Accepting legislation 	decision po knowledge	ints &	

AND NOW...

It is your turn!

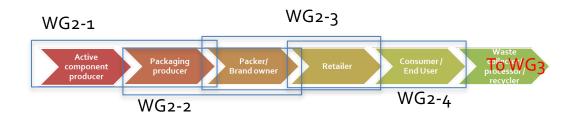
Rotating system

- Roadmap-subjects divided into smaller topics (see next page)
- 10 groups of 5-6 people
- 20 minutes per round, 6 rounds

10:00 - 10:25	Round 1
10:25 - 10:50	Round 2
10:50 - 11:15	Round 3
11:15 – 11:45	Break
11:45 - 12:10	Round 4
12:10 - 12:35	Round 5
12:35 - 13:00	Round 6

Rotating system, different topics





WG₃-1: technical aspects ?? WG₄-1: communication towards science ??

WG3-2: societal aspects ?? WG4-2: communication towards industry / consumers ??

Rotating system, setup

- Setup, subdivision of topics (prev. slide) is ok
- Most groups have 2 WG1, 2 WG2, and 1 WG3 and WG4

subject / group	1	2	3	4	5	6	7	8	9	10
WG1 - Intelligent 1	round 1		round 6		round 5		round 4		round 3	
WG1 - Intelligent 2		round 1		round 6		round 5		round 4		round 3
WG1 - Active 1	round 2		round 1		round 6		round 5		round 4	
WG1 - Active 2		round 2		round 1		round 6		round 5		round 4
WG2 - 1	round 3		round 2		round 1		round 6		round 5	
WG2 - 2		round 3		round 2		round 1		round 6		round 5
WG2 - 3	round 4		round 3		round 2		round 1		round 6	
WG2 - 4		round 4		round 3		round 2		round 1		round 6
WG3-1	round 5		round 4		round 3		round 2		round 1	
WG3-2		round 5		round 4		round 3		round 2		round 1
WG4-1	round 6		round 5		round 4		round 3		round 2	
WG4-2		round 6		round 5		round 4		round 3		round 2



ACKNOWLEDGEMENT

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