

Sherpack Final Workshop



Sherpack: objectives and key results

Caroline Locre | CTP



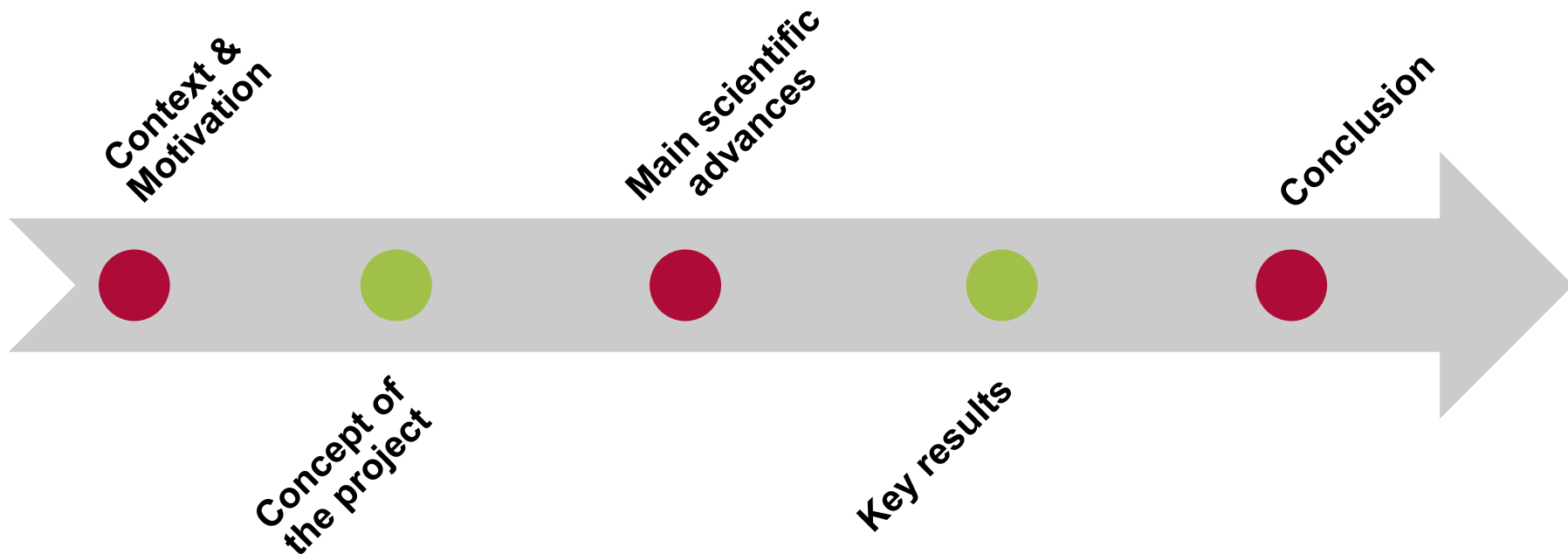
Objectives and Key Results

Caroline Locre

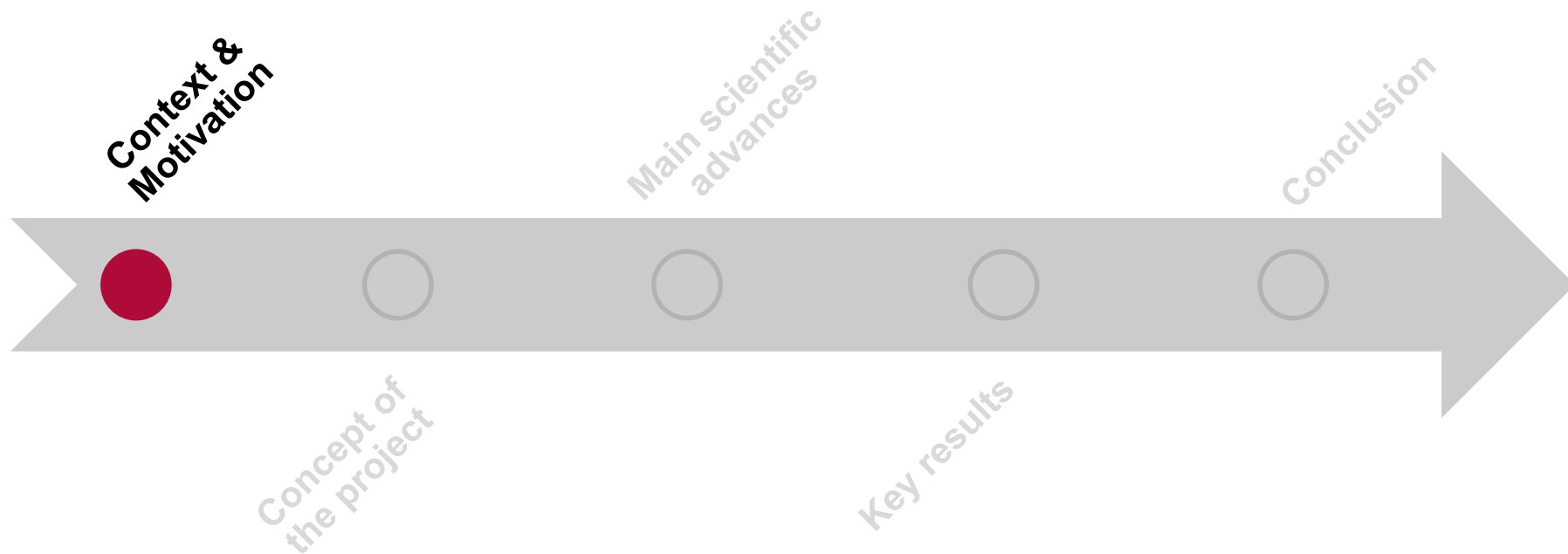
October 7th, 2020



Outline



Outline



Paper & Board packaging

Paper for flexible packaging

- **Papers for sacks and bags**
 - Fruits and vegetables, pet food, take away
- **Specialty/packaging papers**
 - Wax/PE papers for meat, cheese...
 - Greaseproof for baking
 - Stand-up pouches

Board for packaging

- **Container board**
 - Primary and secondary boxes
 - Retail display stands
- **Carton board**
 - Food, pharmaceuticals (FBB, SBB...)
 - Dry food, tools, electronics (WLC)
 - Milk, juice, aseptic products (LBP)



The role of primary packaging

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Contains and protects

Need to ensure **consumers' safety**

Adapted to **specific requirements of the product**

Most varied and demanding barrier

Barrier requirements of products



Barrier requirements	Water vapour	Oxygen	Light	Aromas	Contaminants
Biscuits	H	M	L	M	H
Dehydrated food	H	H	M	M	H
Snacks	H	M	H	L	H
Dairies	L	M	H	H	H
Ready to heat meals	M	M	M	H	H
Pet food	H	H	H	H	H
Coffee	H	H	H	H	H
Beverages	L	H	H	M	H
Red meat	M	L / H	L / H	L	H

H : High M : Medium L : Low

Holst, 2014 adapted by CTP

Different products + Different shelf lives = Different specifications

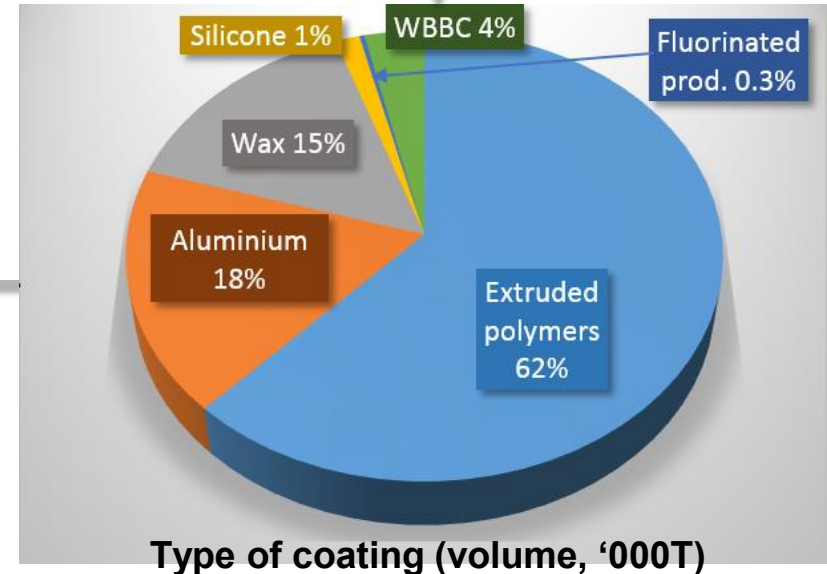
Motivations

Best environmental ranking
Worst barrier performances
before converting

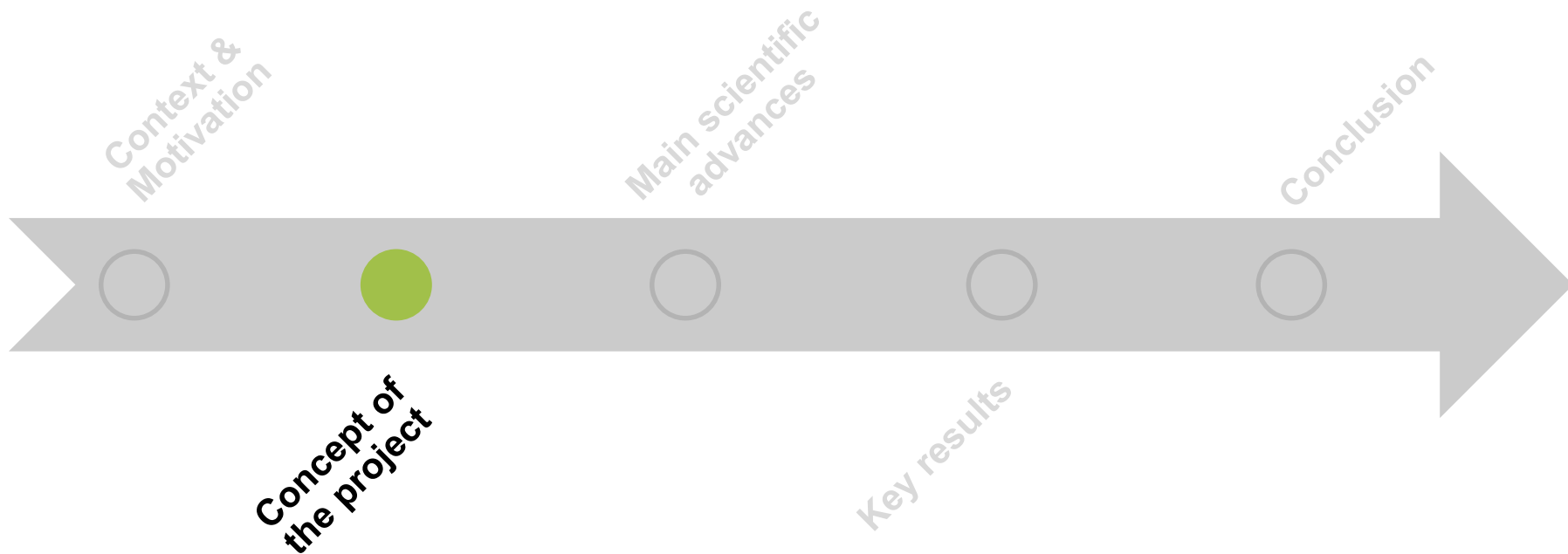
**Necessary to transform
cellulosic substrates**

Market trends

- Phasing out of aluminium
- Biobased materials
- Recyclable materials
- Removal of fluorinated compounds
- Functional single-serving packaging



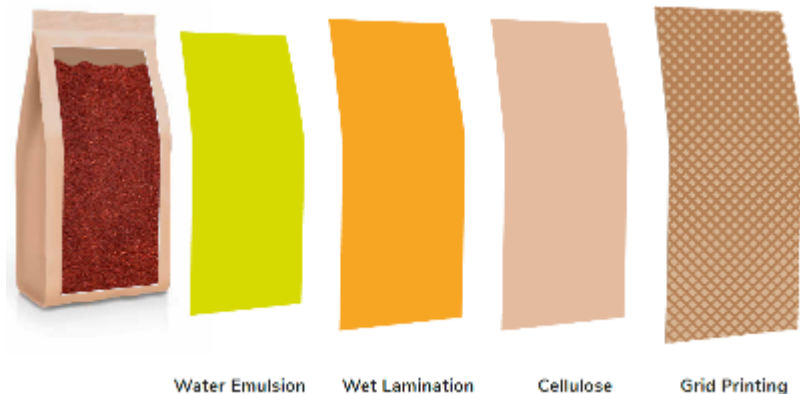
Outline



Concept & Consortium



Development of a **renewable**, **biodegradable** and **recyclable** flexible paper-based packaging material that can be **converted** by heat-sealing and folding, with improved stiffness and grip.

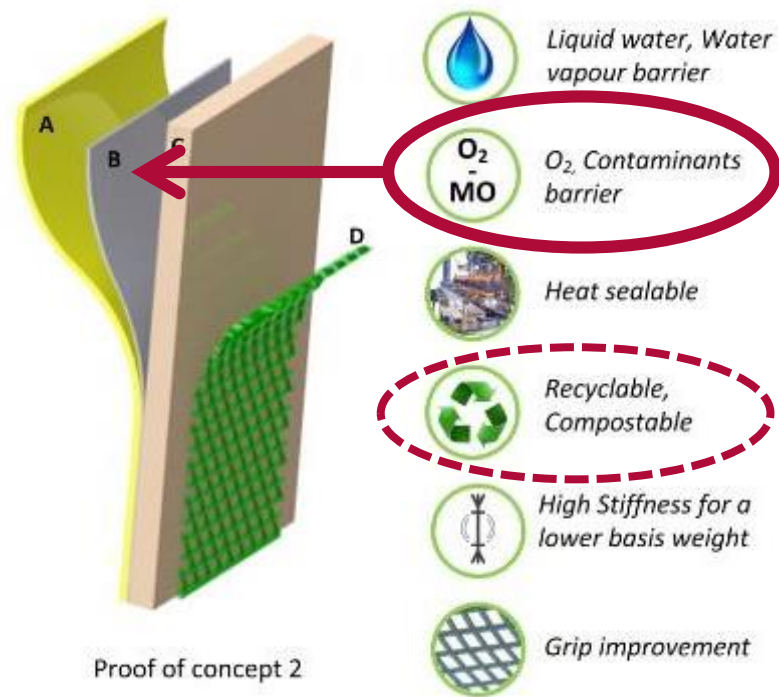
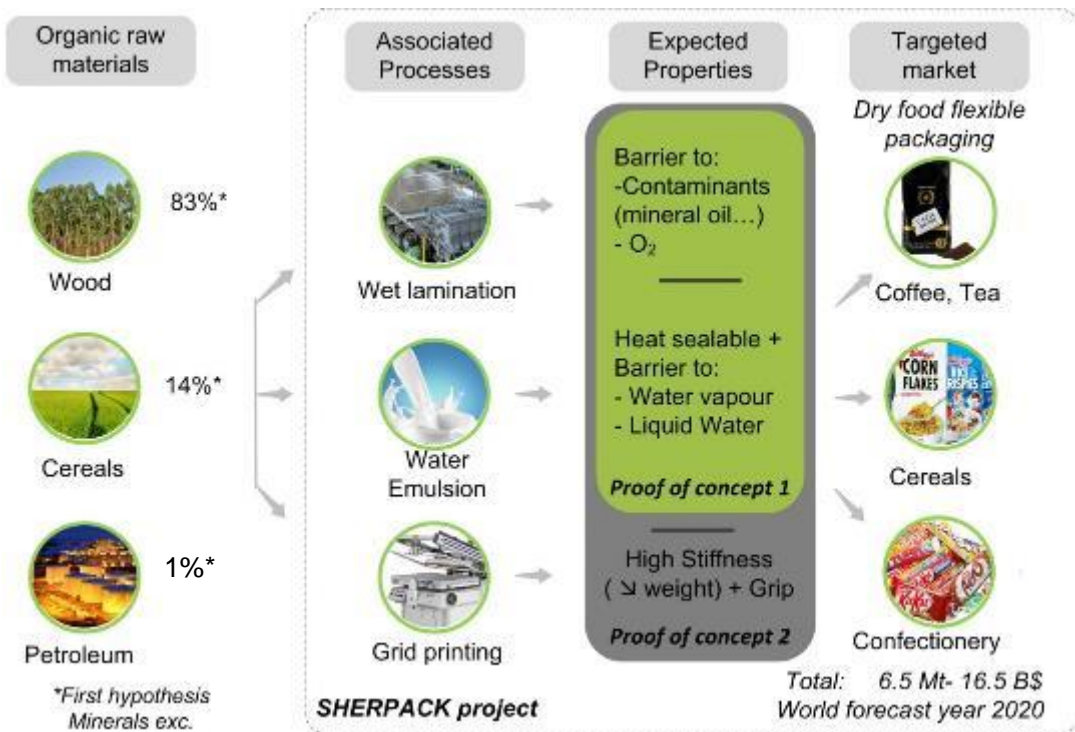


2017 – 2020

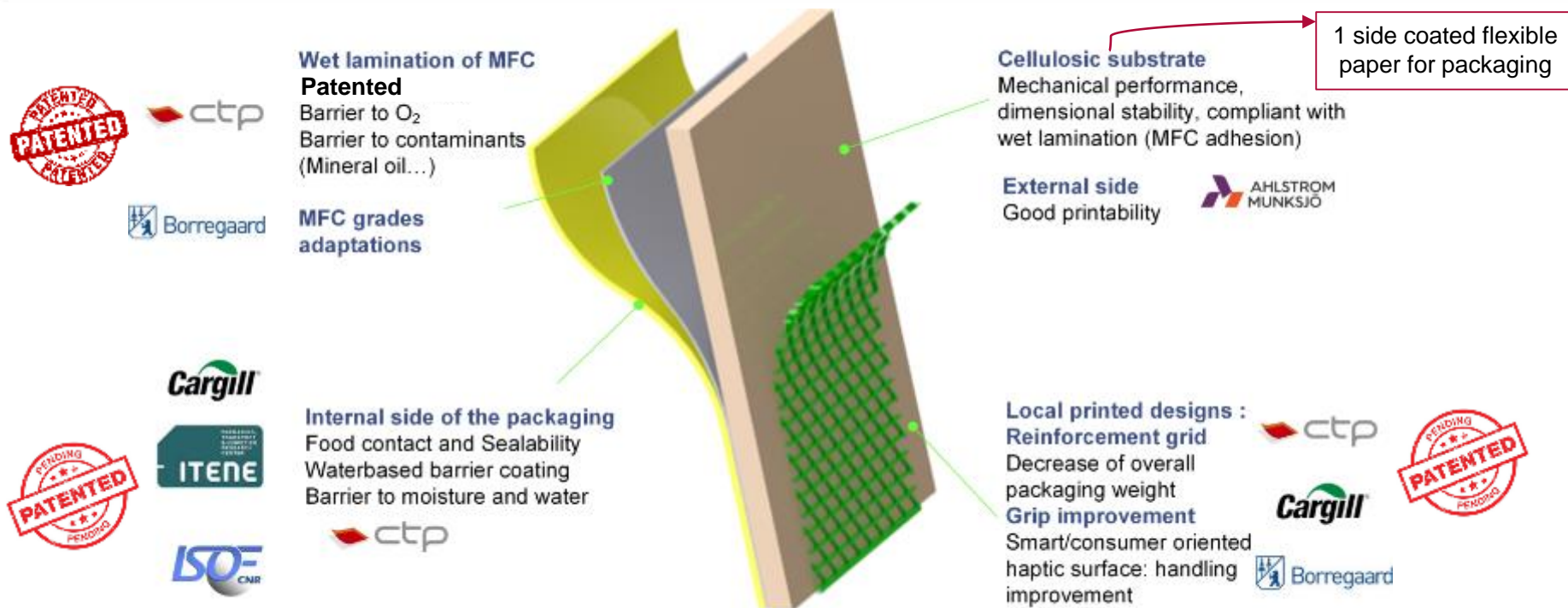
www.sherpack.eu



Targeted markets and proof of concept

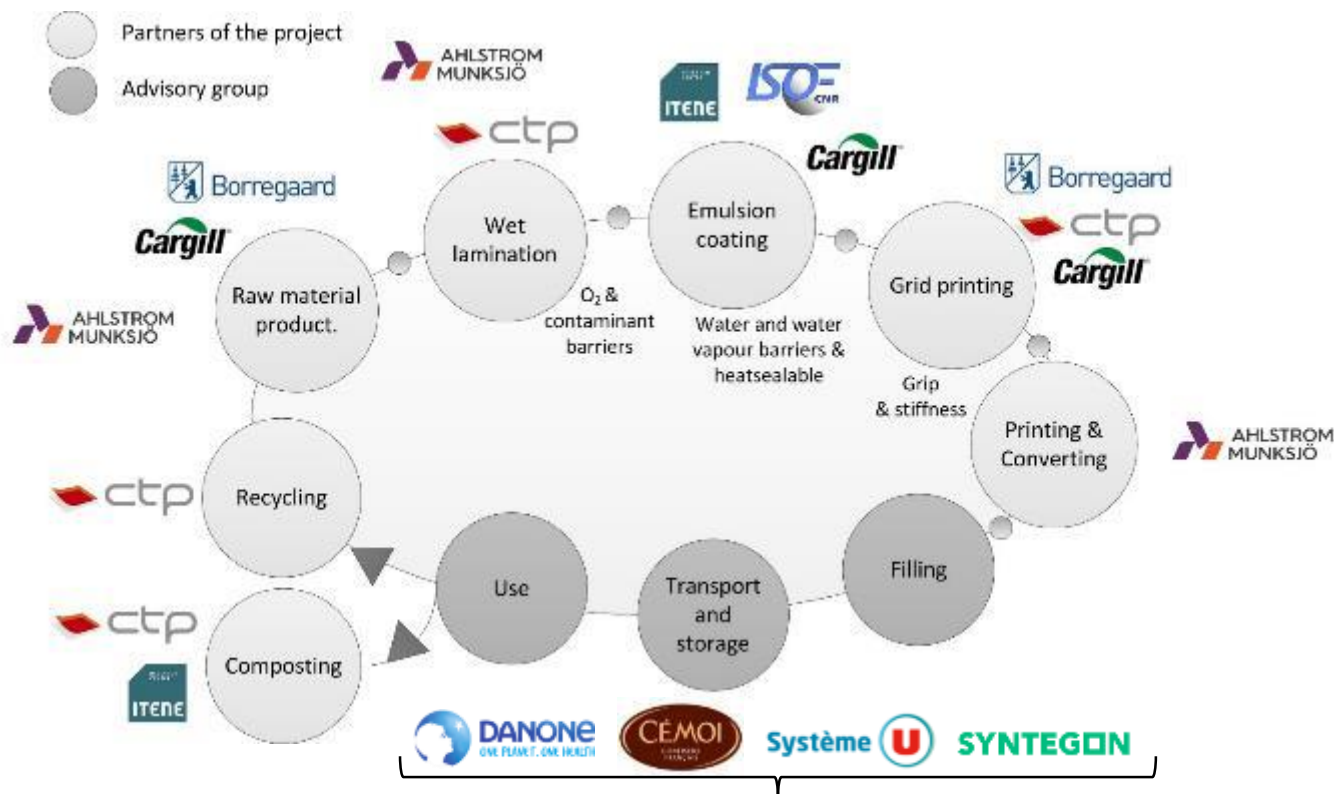


Activities and proofs-of-concept

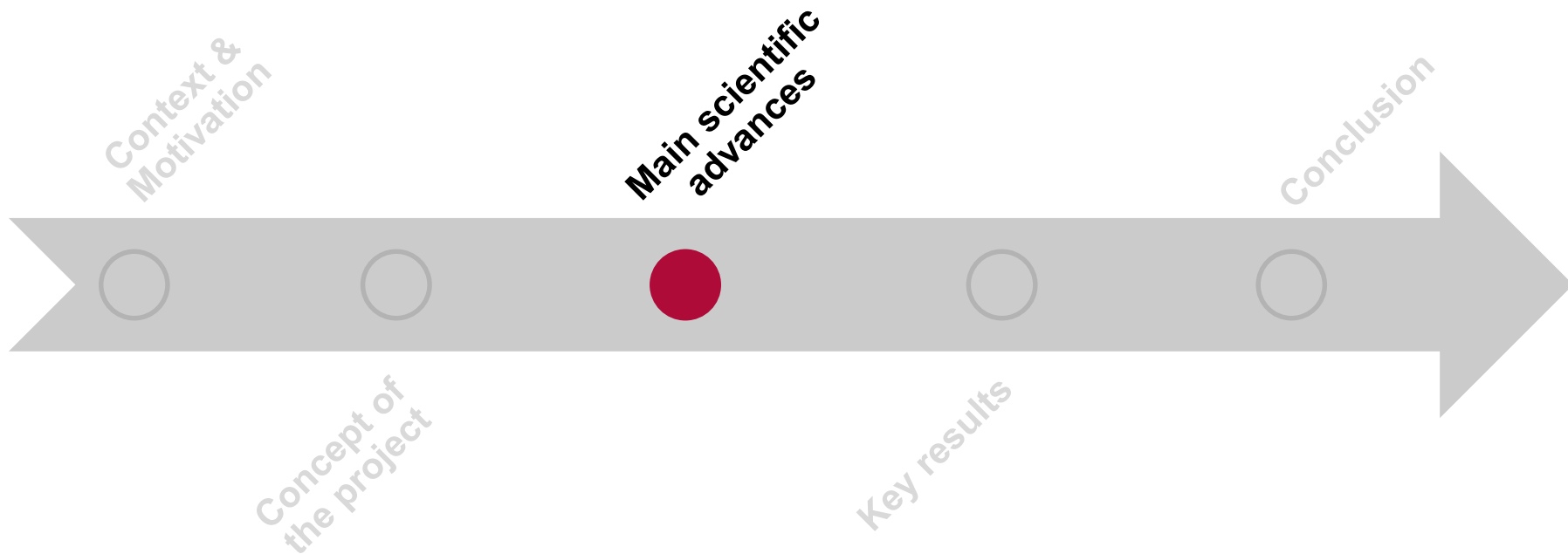


2 proofs-of-concepts produced at lab scale (with and without the grid)

Value chain of the project



Outline



Food contact compliance

- A material designed to **ensure consumers' safety**
- **Paper substrate** and **polysaccharide grid** compliant with food contact regulations and recommendations in Europe
- **MFC** compliant with BfR XXXVI Recommendation



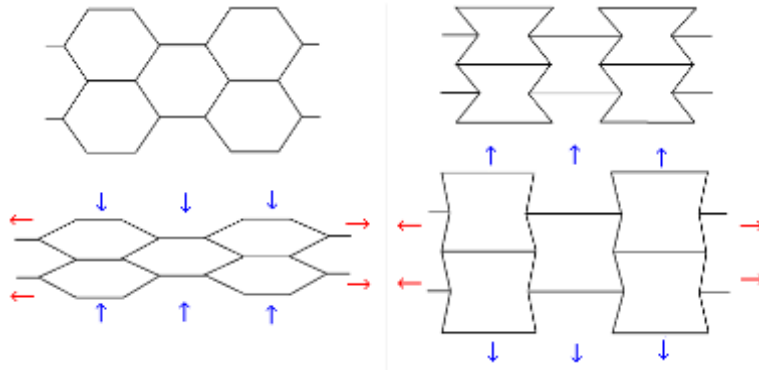
Food contact compliance

- A material designed to ensure consumers' safety
- Paper substrate and polysaccharide grid compliant with food contact regulations and recommendations in Europe
- MFC compliant with BfR XXXVI Recommendation
- **PLA-based polymer emulsion** developed with food contact compliance in mind
 - No forbidden substances / additives
 - No chlorinated solvents used during the emulsion process



Grid reinforcement

- Polysaccharides grid printed on the paper surface to improve bending stiffness



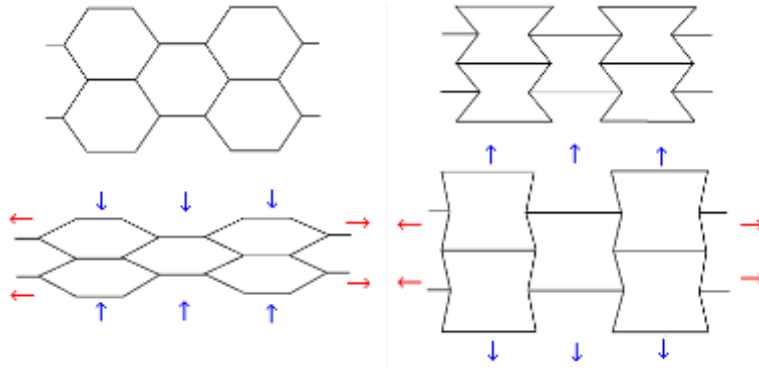
Non-auxetic

Auxetic



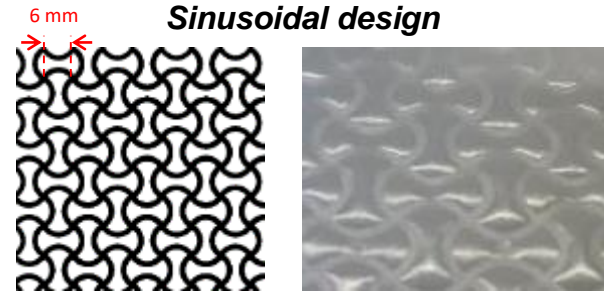
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Non-auxetic

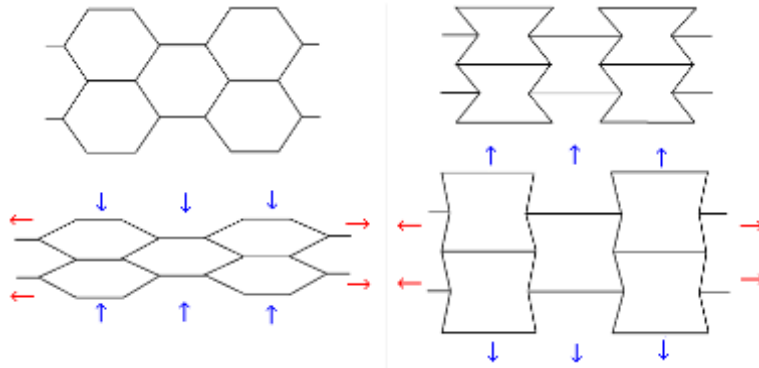
Auxetic



Sinusoidal design

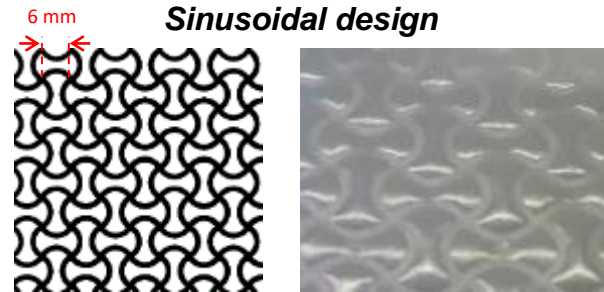
Grid reinforcement

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Non-auxetic

Auxetic



**Bending performance x3 at 50% covering ratio
Starch best of the polysaccharides tested**

- Several strategies investigated for end-of-life

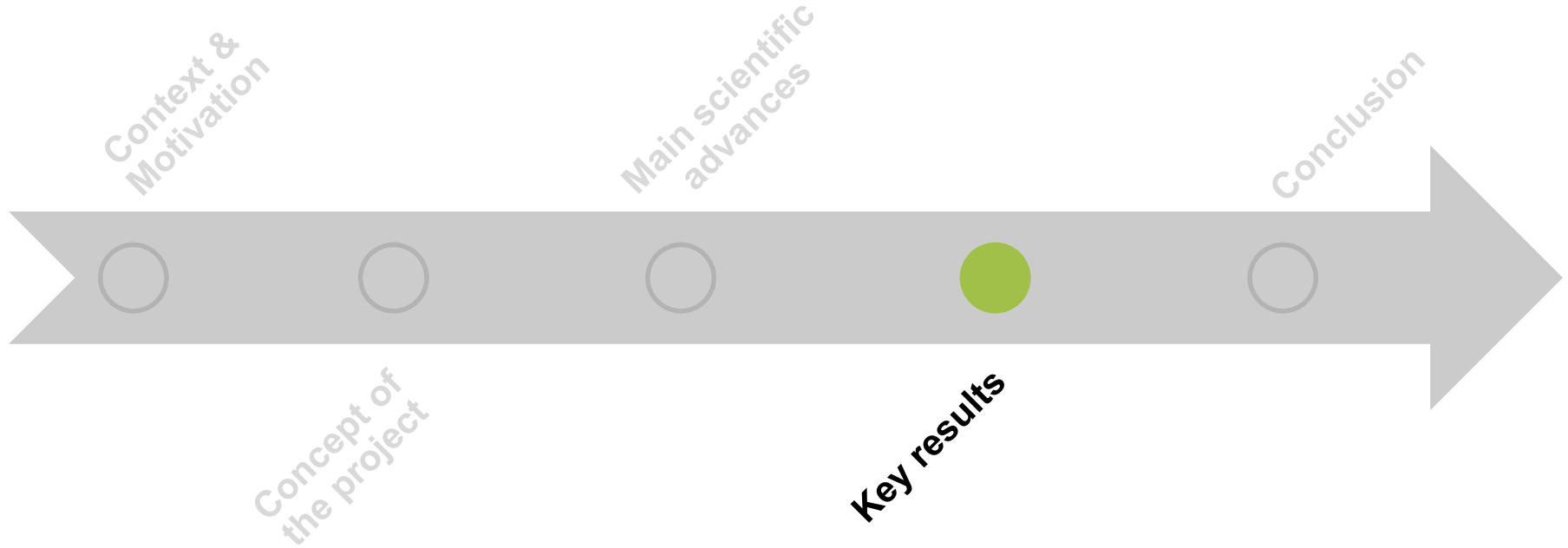
Recycling

Composting
(ongoing)

**Energy
valorisation**

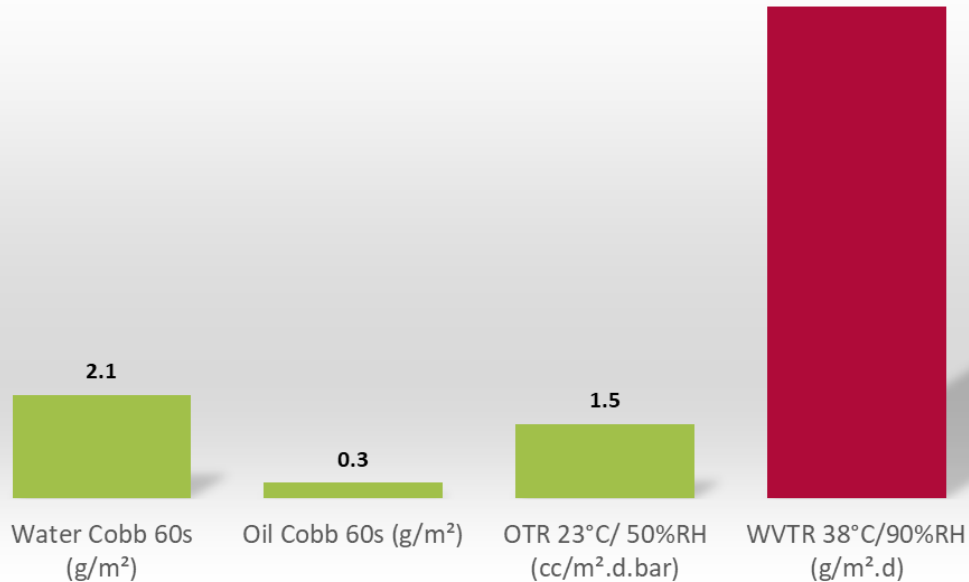
- Life cycle assessment ongoing
 - Carbon footprint close to fossil based counterpart

Outline



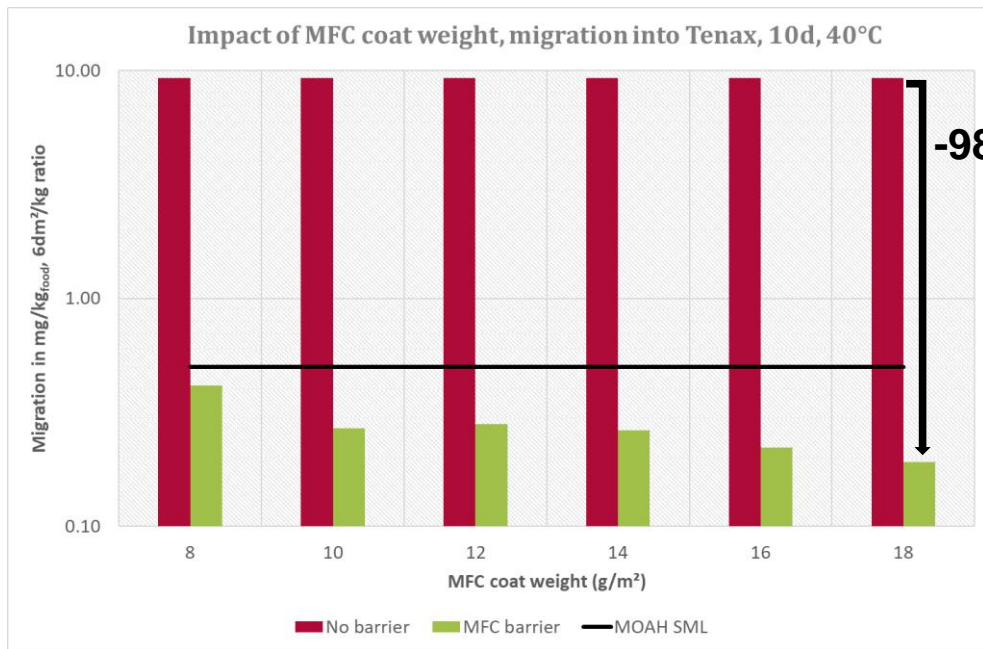
Barrier performances

Best barrier performances achieved



- Similar results between the 2 Proofs-of-Concept
 - No impact of the grid
- Excellent water, grease, and oxygen barriers
- Water vapour barrier not good enough (>200)
 - Significant improvement needed

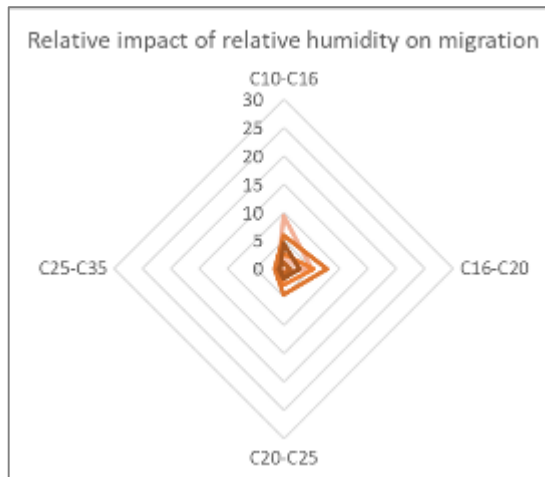
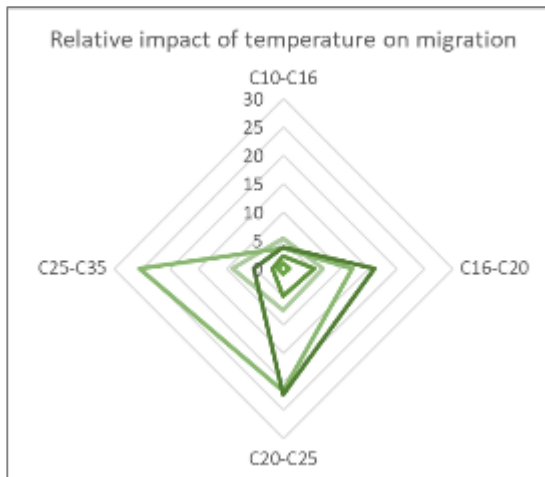
Barrier performances



- Impact of **coat weight of the barrier** on the mineral oil migration
 - Thicker layer = better barrier
- Excellent barrier in any case
 - Significant reduction of mineral oil migration through the barrier
- **Total** MO migration below MOAH migration limit (0.5 mg/kg)

Barrier performances

- Impact of **climatic conditions** on the mineral oil barrier performance



Significant impact of temperature compared to relative humidity

- Heavier MO fractions more affected by temperature
- Lighter MO fractions more affected by humidity

Extract of results – more details in a future article

Heat-sealability

- Tested on a Brugger press
- Seal strength
 - ~1N for 1s sealing at 6bar, 200°C
 - ~0.5N for 0.5s sealing at 6bar, 140°C

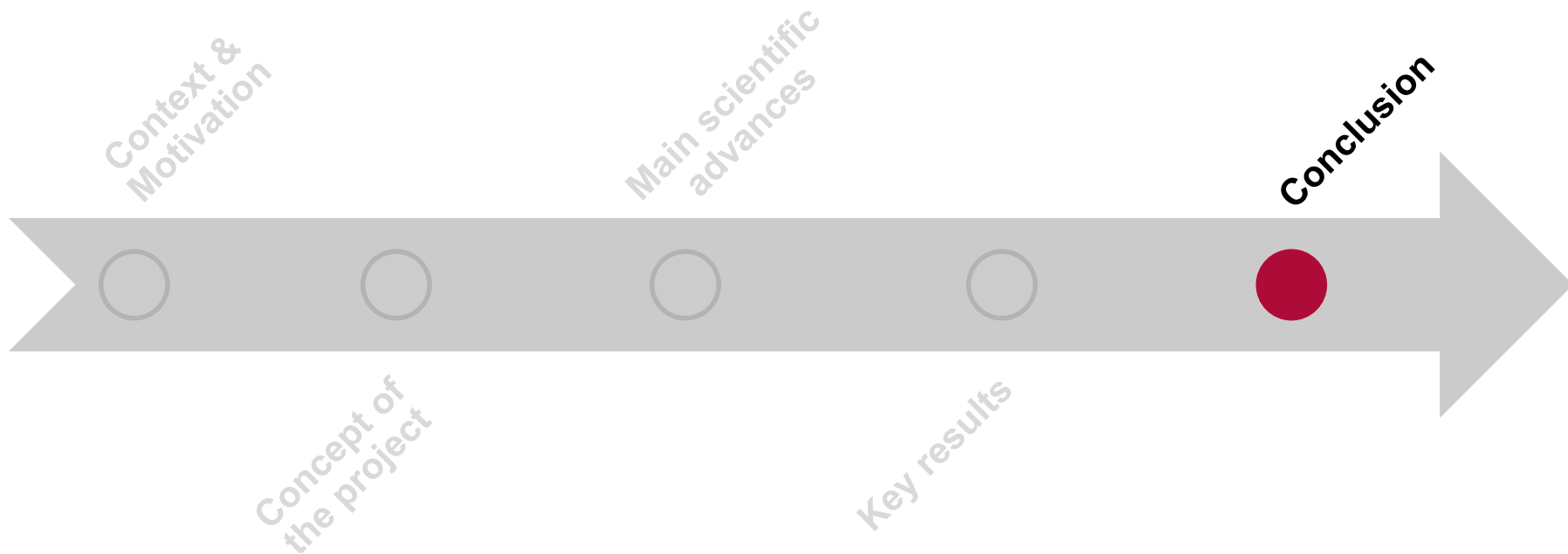
Seal strength should be improved

Possibly through increase
of coating layer thickness

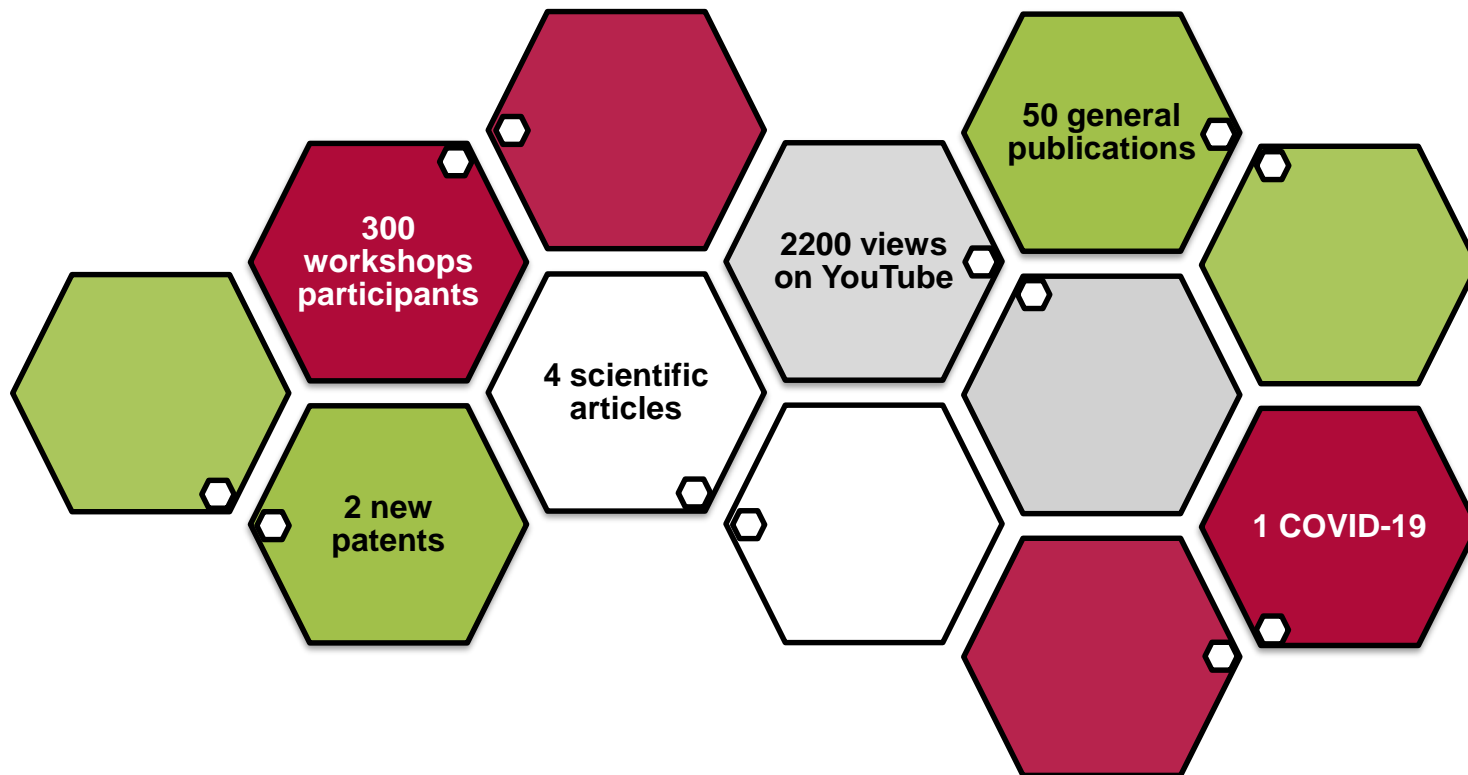
Printability

- Proof-of-Concept #1
 - Good printability by flexography and screen printing
 - Gravure printing under investigation
- Proof-of-Concept #2
 - Unprintable in its final state due to the grid
 - Other printing strategy needed, i.e. printing before applying the grid

Outline



Sherpack key numbers



Before we part...





Thank you for your attention

Any question?



Horizon 2020
European Union Funding
for Research & Innovation

