



# Comparative LCA of thermal insulation on building element level, using Umberto

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**19TH UMBERTO USER WORKSHOP 2014**

**17 September 2014, Germany**

# About the Northern France region



11 years of regional based eco-entreprise support

-  **Water**
-  **Energy**
-  **Eco-construction**
-  **Eco-materials**
-  **Recycling**



# The [avniR] LCA Platform



A collaborative resource centre for Life Cycle Thinking in the Northern France region

2009: Creation of [avniR] Life Cycle Platform



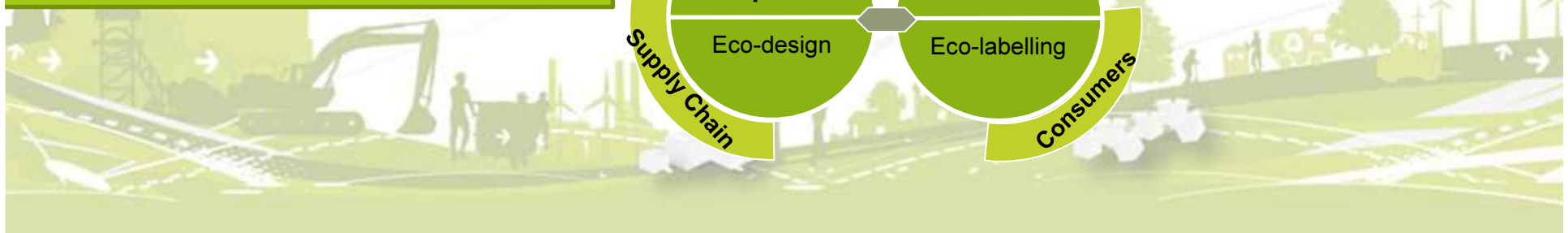
-  Water
-  Energy
-  Eco-construction
-  Eco-materials
-  Recycling

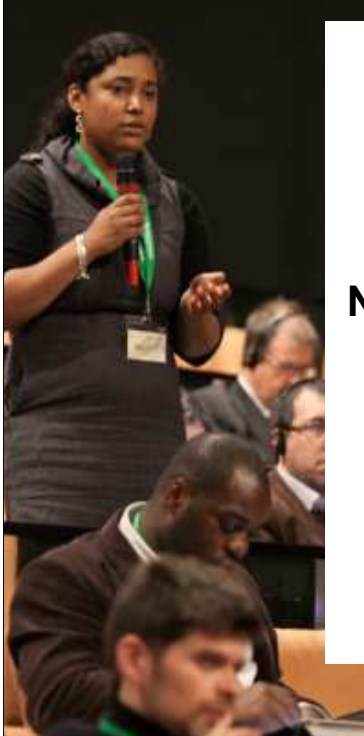
10 years of eco-enterprise support in Nord-Pas de Calais



In order to...

Integrate Life Cycle approaches into all economic sectors





5 and 6  
Novembre  
2014,  
Lille,  
France

L.C.A  conference



<http://www.avnir.org/FR/Congres-ACV-8.html>



CONCOURS | ÉCO-CONCEPTION  
[avnir] | 2014



## European Projects

**PEF**  
Product Environmental  
Footprint Thermal Insulation



**OLCIP**  
LIFE CYCLE IN PRACTICE

**CAP'EM**  
Cycle Assessment Procedure for Eco-impacts of Materials



# ***PEF***

## ***Product Environmental Footprint***

***3 years pilot to harmonize LCA approaches  
B2B and B2C communication***



***The methods of calculation and communication of  
environmental impacts for thermal insulation  
products***

# Overview



## Introduction

- **About the Product**
- **Aims of this project**

## Scope of the study

- **Functional Unit and assumptions**
- **System boundaries**

## Results

- **Results**
- **Conclusions**



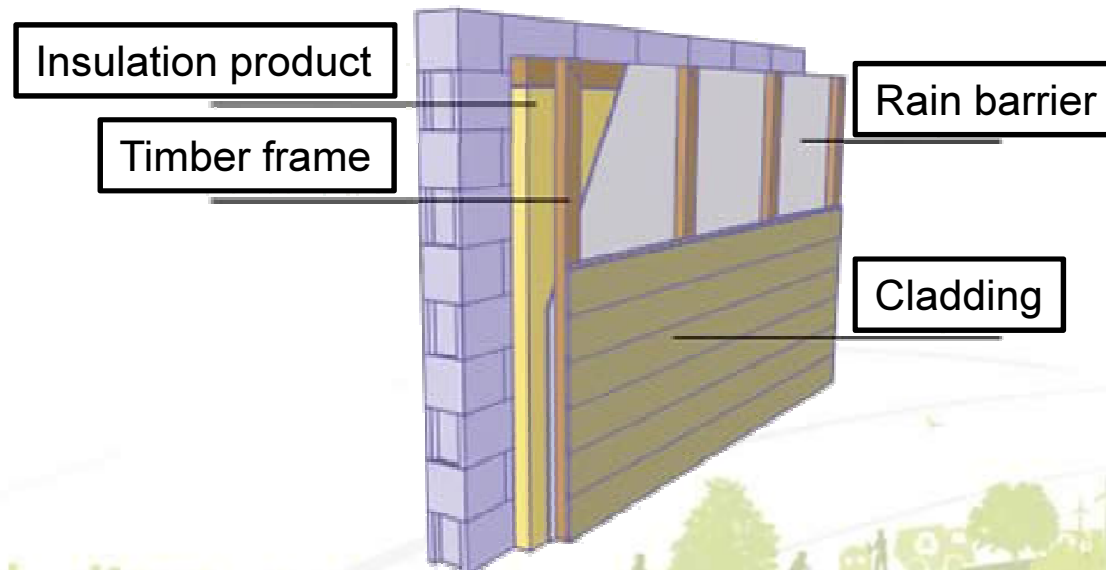


# INTRODUCTION

# About the Product



- **Thermal bridges**
- **Living area**
- **Climate protected walls**

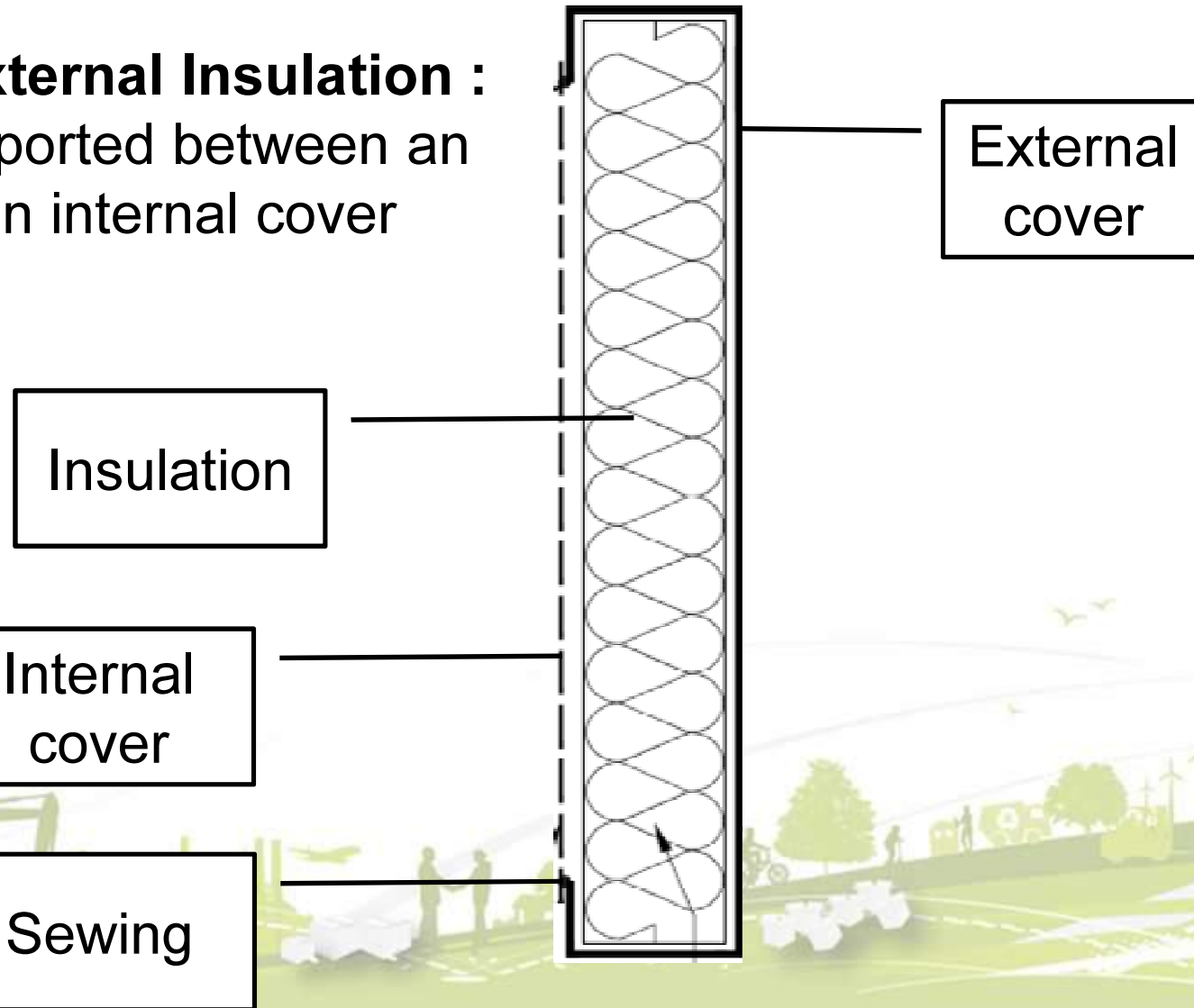




# About the Product



**Innovative External Insulation :**  
Insulation supported between an external and an internal cover



External cover

Insulation

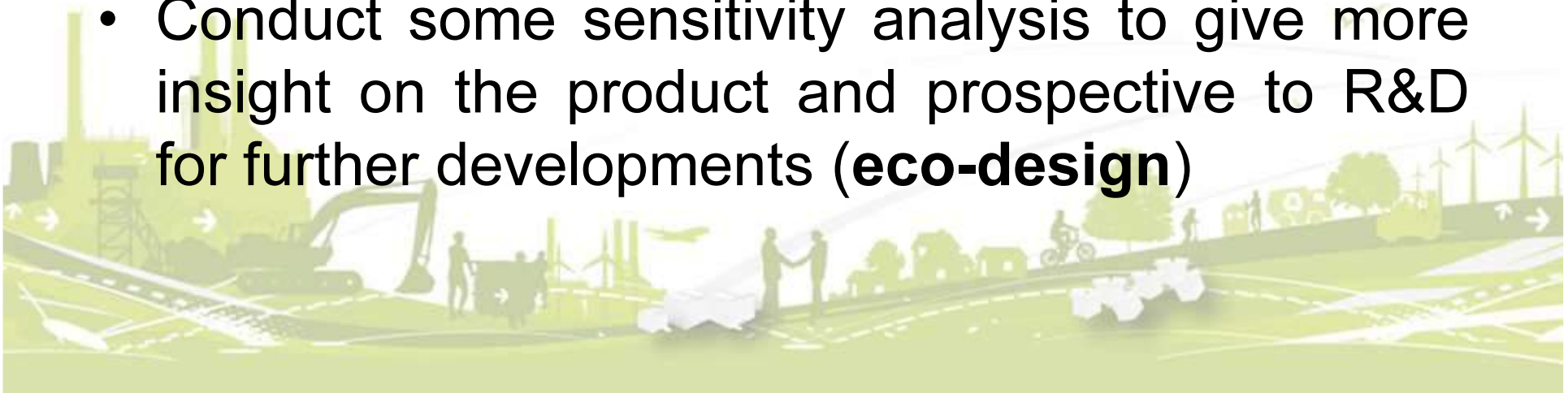
Internal cover

Sewing

## Aims of this project:



- Realize the Life Cycle Assessment(LCA) of the insulation product and communicate the results to **NORPAC**
- Test the Umberto software on a real case
- Analyze and define the hotspots of the product
- Conduct some sensitivity analysis to give more insight on the product and prospective to R&D for further developments (**eco-design**)





# SCOPE OF THE STUDY

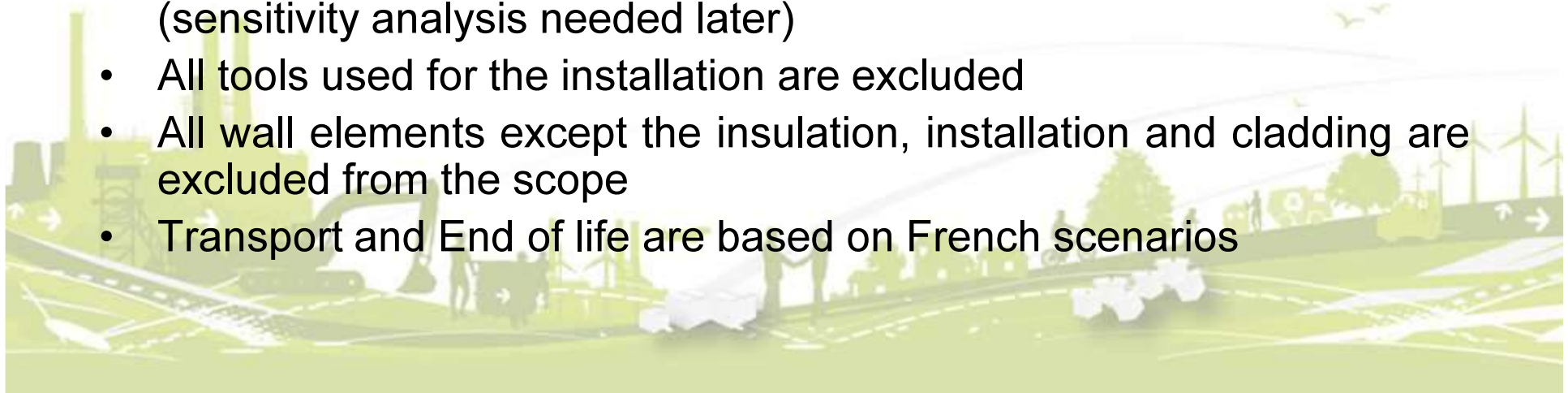
# Functional Unit and assumptions



**1 m<sup>2</sup> of a thermal insulation** product with a thickness that gives a design thermal resistance of  **$R = 2.95 \text{ m}^2 \cdot \text{K/W}$**  including the facing with an expected average reference service **life of 50 years**

## Assumptions:

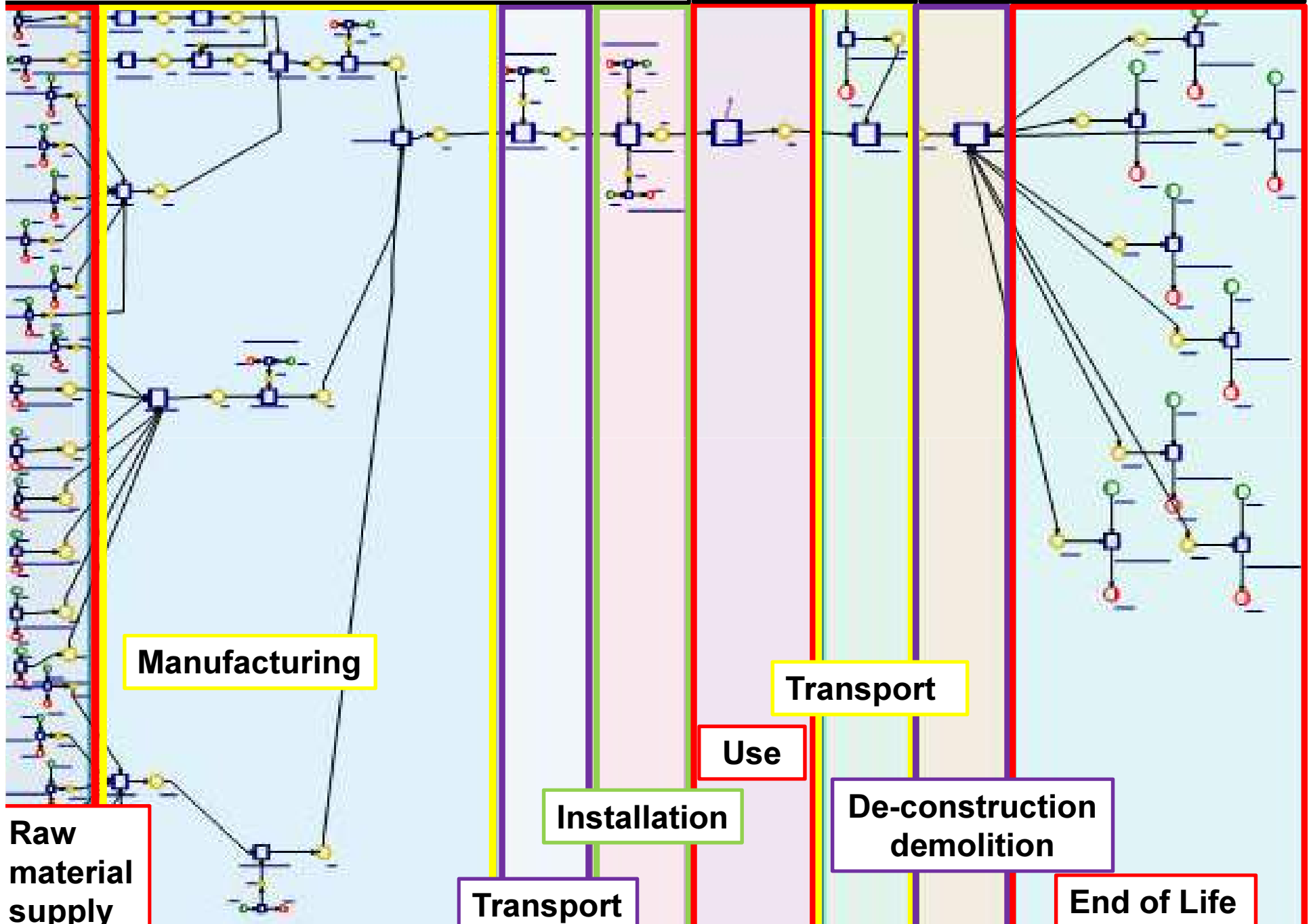
- RSL of the building is 50 years in this study
- The life of the product is 50 years (sensitivity analysis seems important for the next steps of the study)
- Maintenance, repair, replacement and refurbishment are excluded (sensitivity analysis needed later)
- All tools used for the installation are excluded
- All wall elements except the insulation, installation and cladding are excluded from the scope
- Transport and End of life are based on French scenarios



**PRODUCT and CONSTRUCTION stage (A)**

**USE stage B**

**End of Life (C-D)**



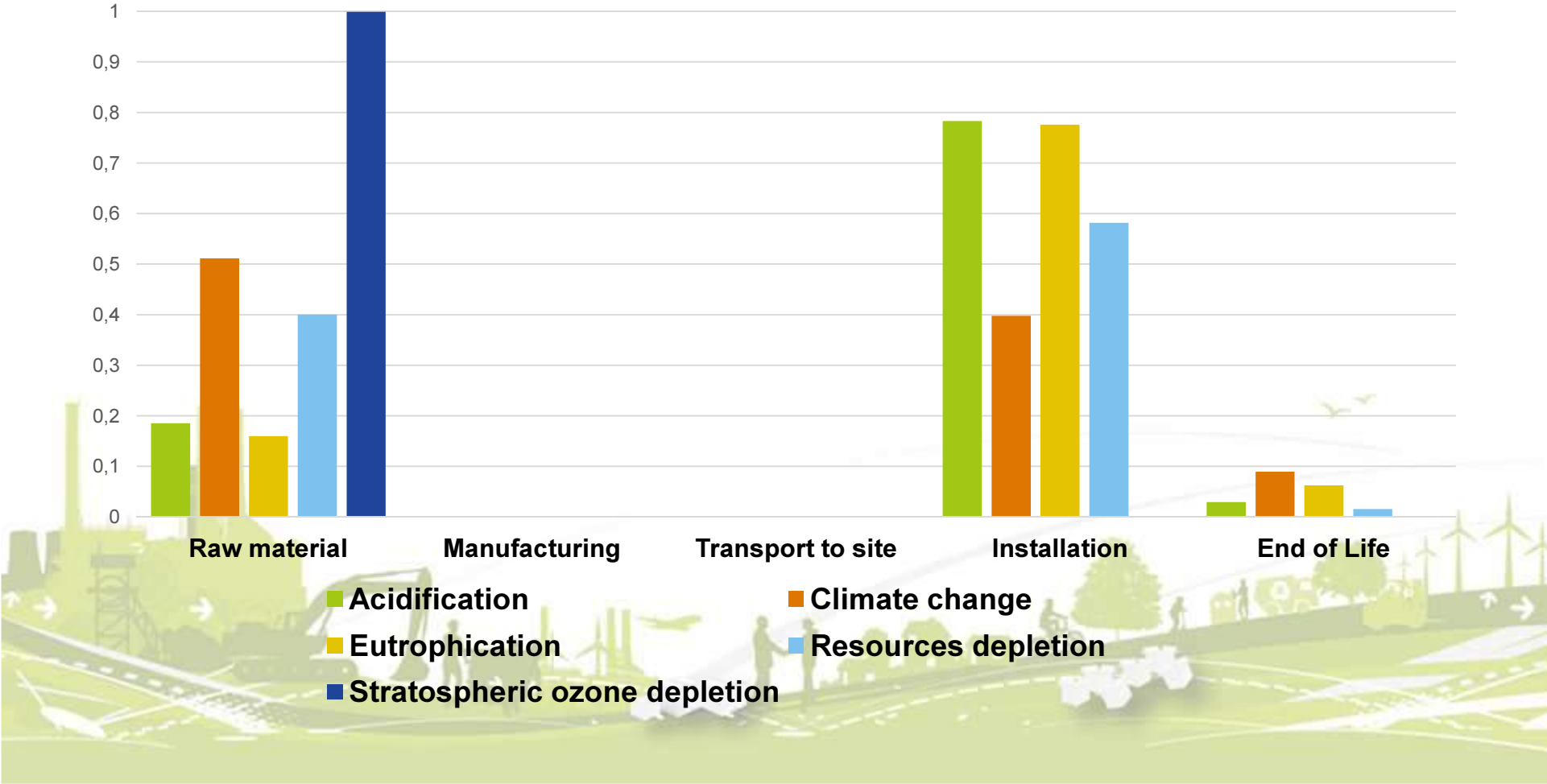


# RESULTS

# Results



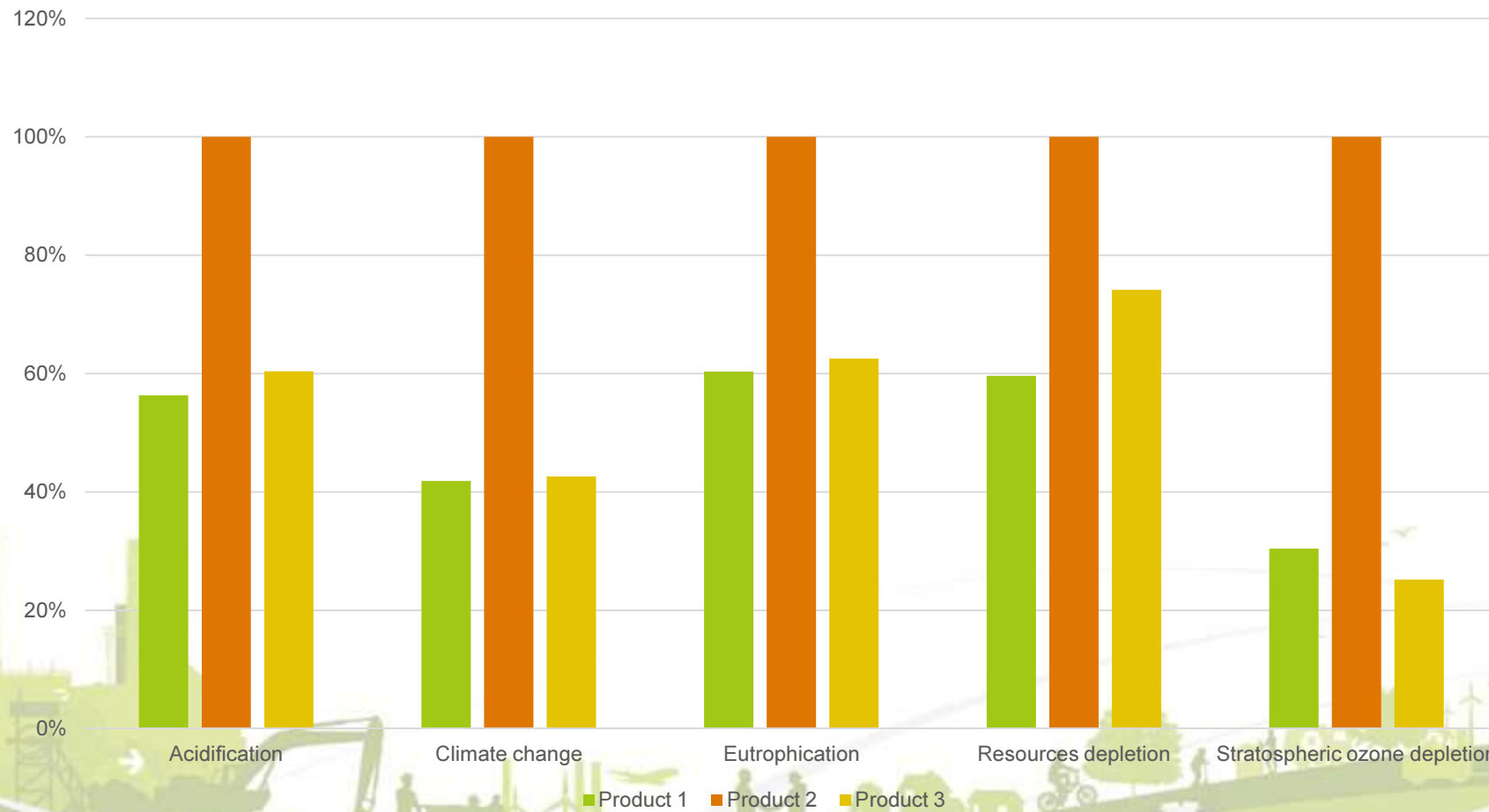
## Contribution of the impacts CML method of the product on different stages of life cycle



# Comparative Results



## Comparing different insulating materials





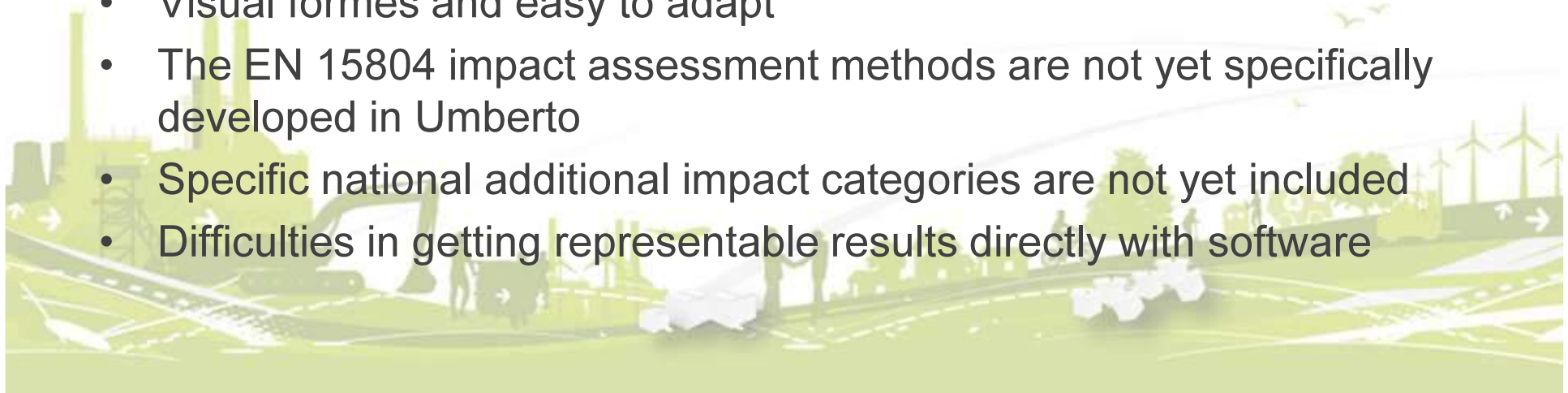
# Conclusions and prospective



- During this study we identified major process and hotspots for improvements
- Additional sensitivity analysis need to be realized on the basis of different lifespan of the building and the lifetime of the product
- Alternative insulation material was identified (the product 1)
- Installation process, specifically the additional components like fabrics are highly impacting

For software:

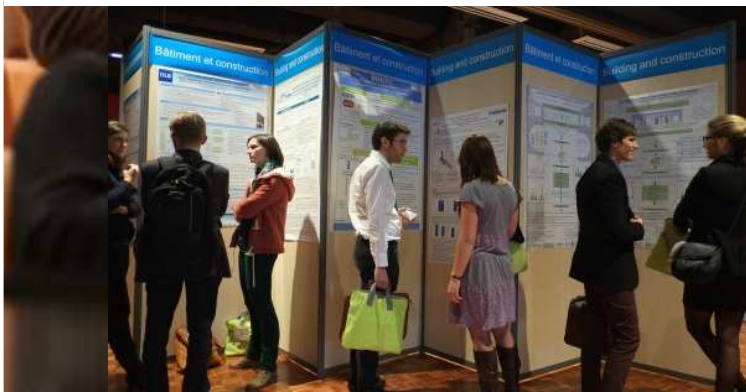
- Visual formes and easy to adapt
- The EN 15804 impact assessment methods are not yet specifically developed in Umberto
- Specific national additional impact categories are not yet included
- Difficulties in getting representable results directly with software





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