

# SWIM and Horizon 2020 Support Mechanism

Working for a Sustainable Mediterranean, Caring for our Future

## BUILDINGS AS MATERIALS BANKS

Presented by:

**Caroline HENROTAY**, Project Manager BAMB project

**SWIM and Horizon 2020 SM Study visit CDW**

25.-27.09.2017, Leuven & Brussels, Belgium

Day 2: Co-organised by



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## WHAT IS BAMB?

# Developing Buildings as Material Banks, eliminating waste and establishing symbiosis in supply industries

Horizon 2020 – WASTE 1 2014 – Moving towards a circular economy through industrial symbiosis

- Starting date: 1st of September 2015
- Duration of 3,5 years
- Consortium of 15 partners from 7 EU countries





# STARTING POINT

## Waste



**Building sector:**  
**+/- 35 % of EU  
waste**

## Virgin resources

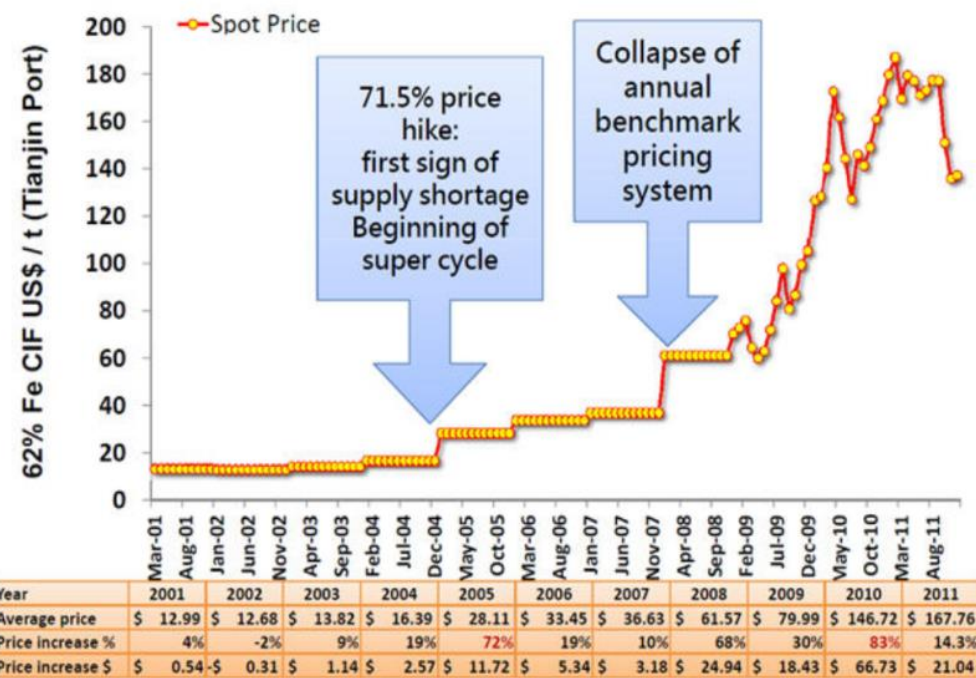


**Building sector:**  
**30 to 50% of natural resources  
used in EU**



# STARTING POINT

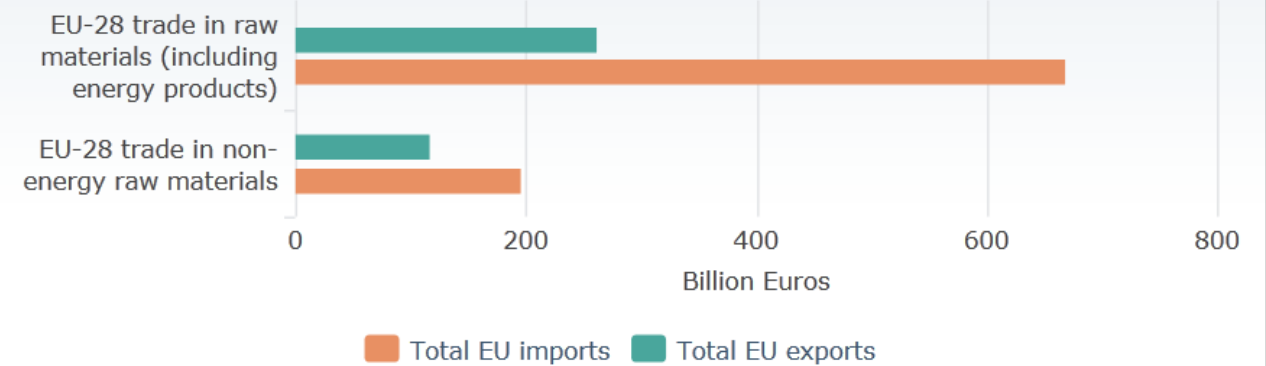
## Increasing prices



Source: <http://www.mining.com/forget-gold-iron-ore-is-the-story-of-the-decade/>  
Dec 2013

## Resource dependence

### EU-Trade raw materials in figures (2011)

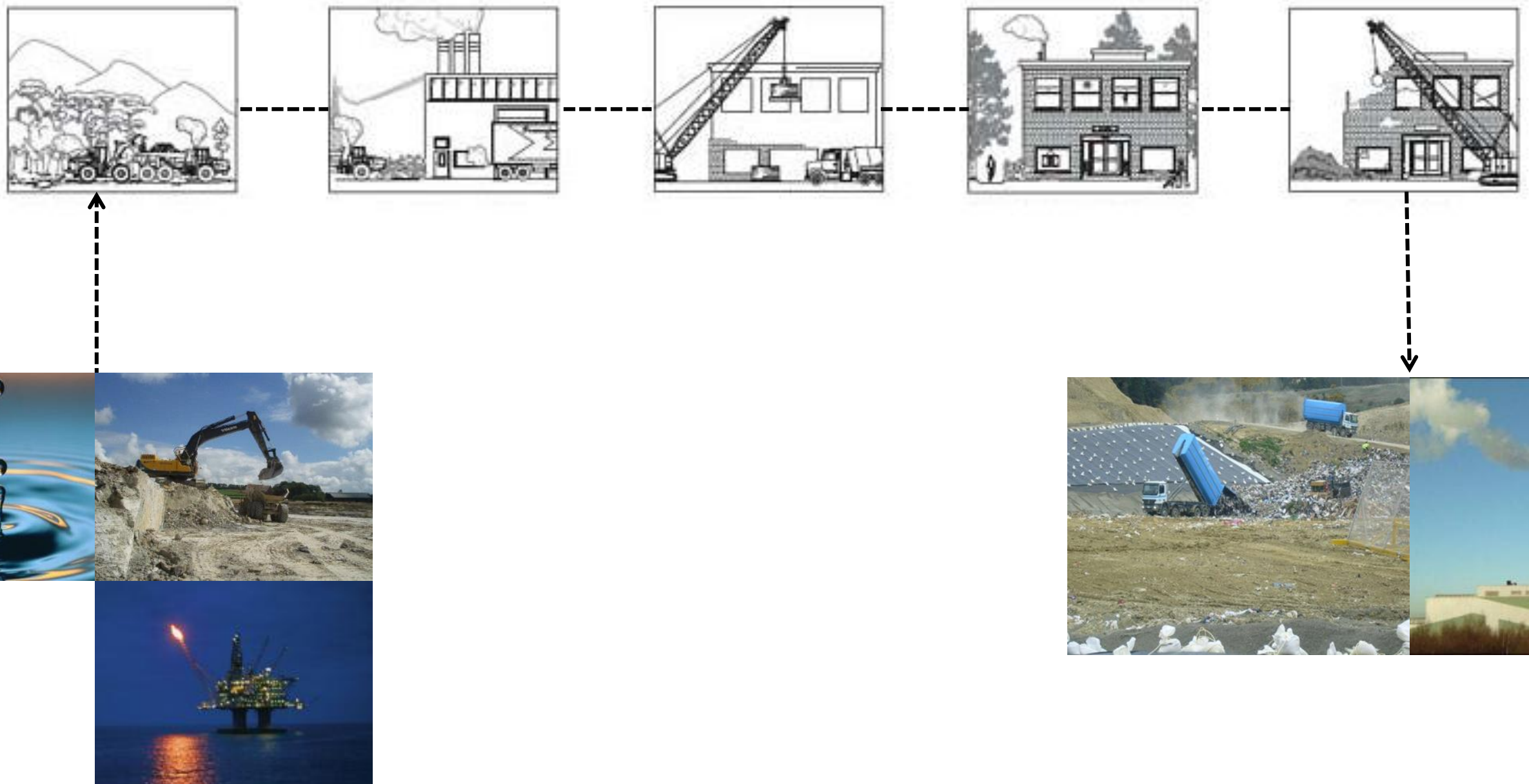


Source: [ec.europa.eu/trade/policy/accessing-markets/goods-and-services/raw-materials/index\\_en.htm](http://ec.europa.eu/trade/policy/accessing-markets/goods-and-services/raw-materials/index_en.htm)  
Dec 2013



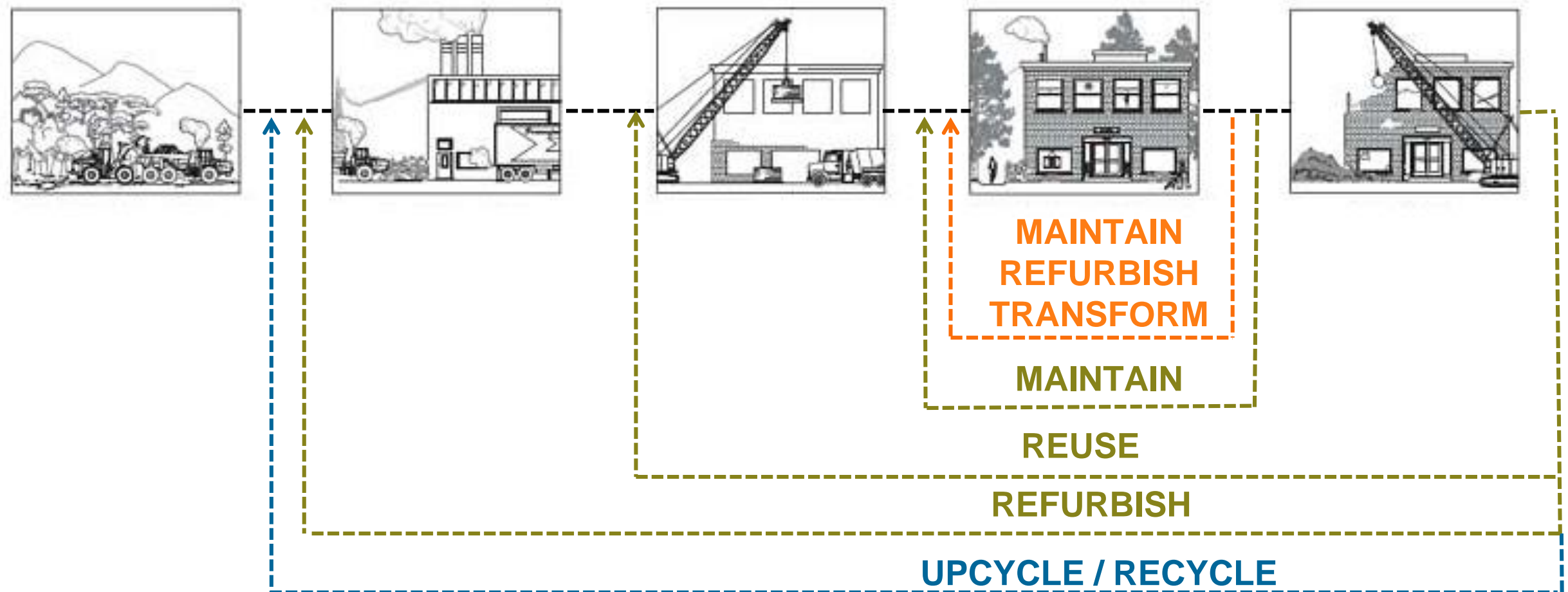
# OBJECTIVES

From a linear and static built environment ...



# OBJECTIVES

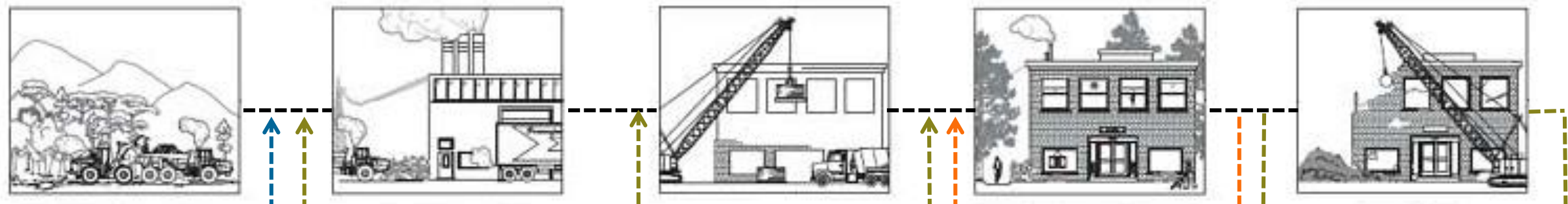
... to a circular and dynamic built environment



- **BUILDINGS**
- **BUILDING PRODUCTS & SYSTEMS**
- **MATERIALS**

# OBJECTIVES

... to a circular and dynamic built environment

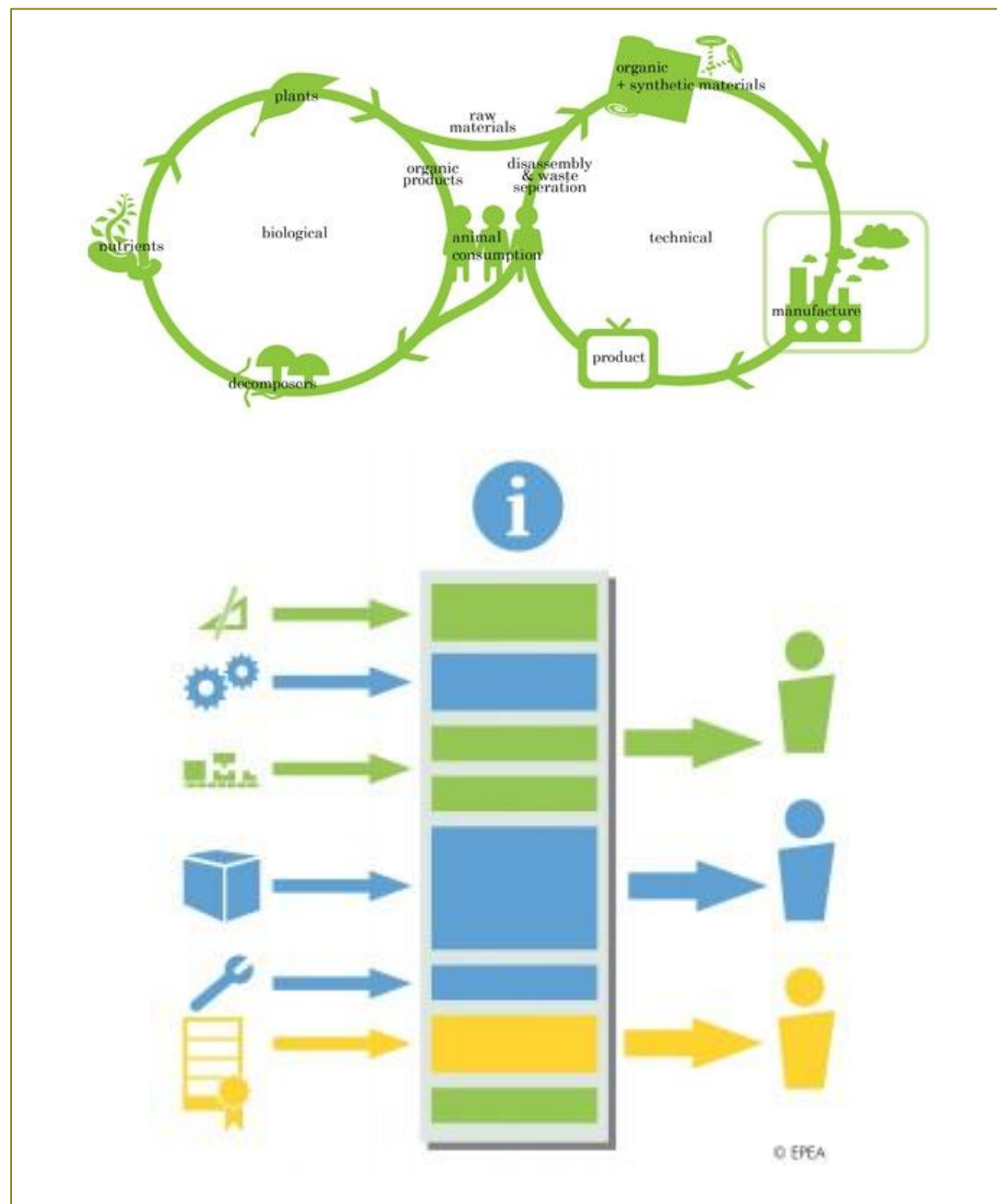


- Develop a sustainable life cycle management of materials, products and buildings, eliminating waste and reducing the use of virgin resources
- Reduce the costs by managing resources rather than managing waste.
- Preserving the buildings, its components and materials' residual value so that manufacturers and owners will be able to make money out of their "waste" by high quality reuse and recycling strategies.

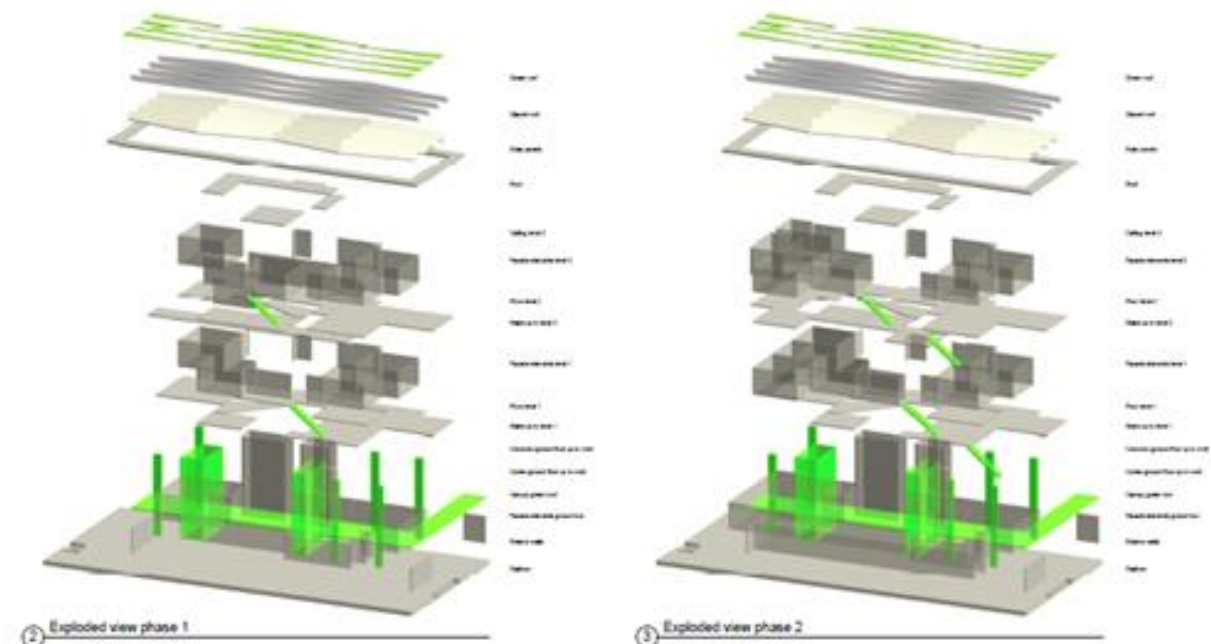


# RE-THINKING THE DESIGN AND BUILDING VALUE

## CHAIN Material Passports



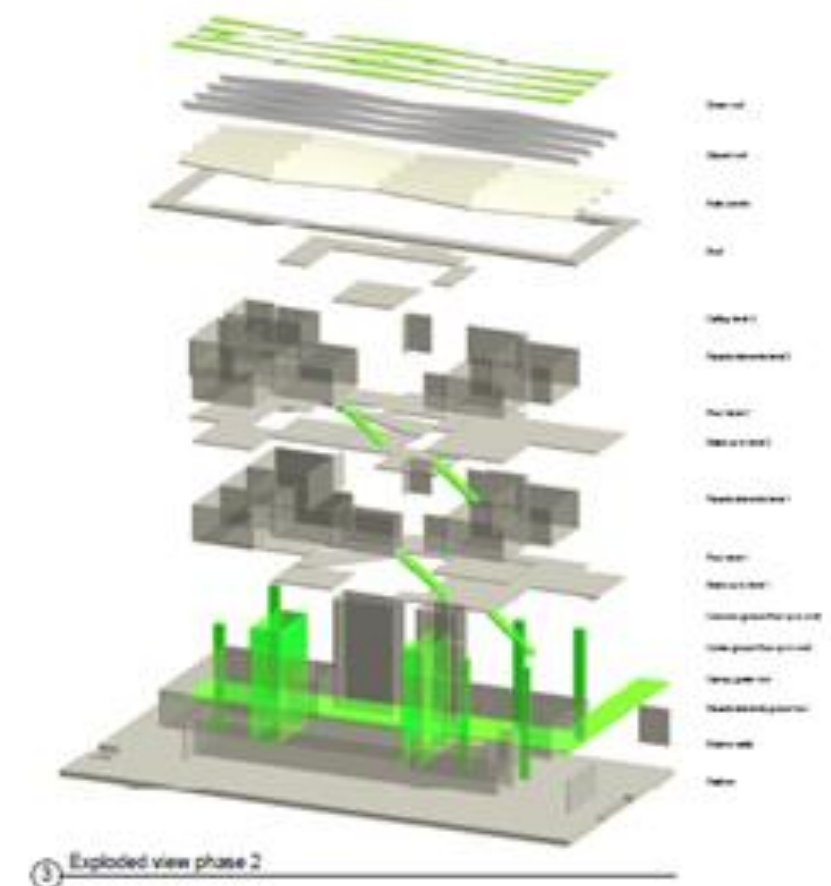
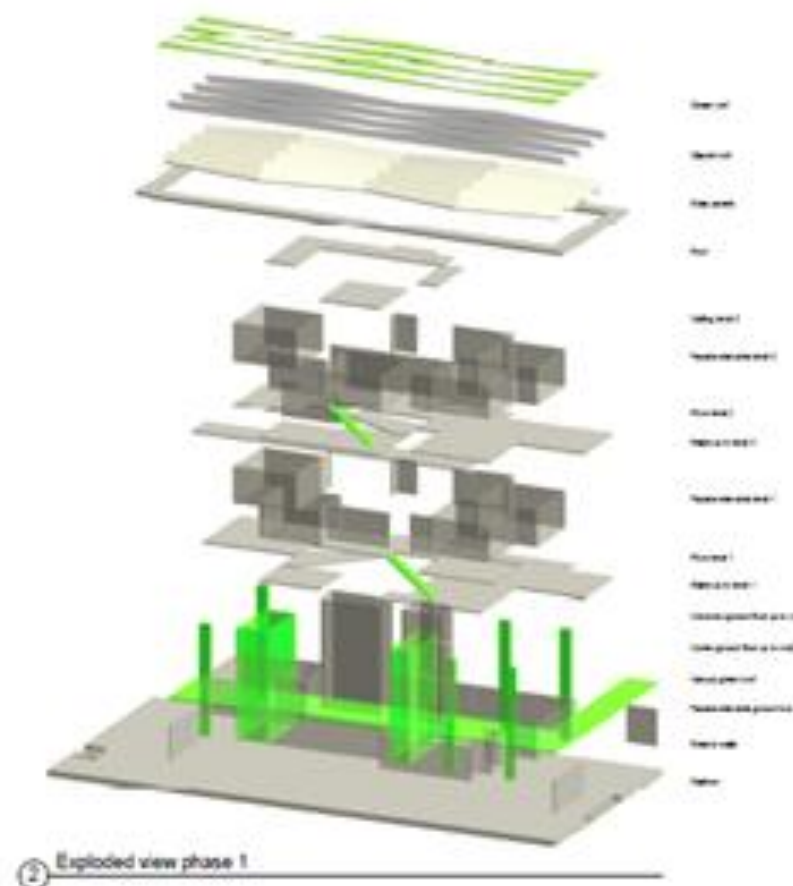
## Reversible Building Design





# REVERSIBLE BUILDING DESIGN

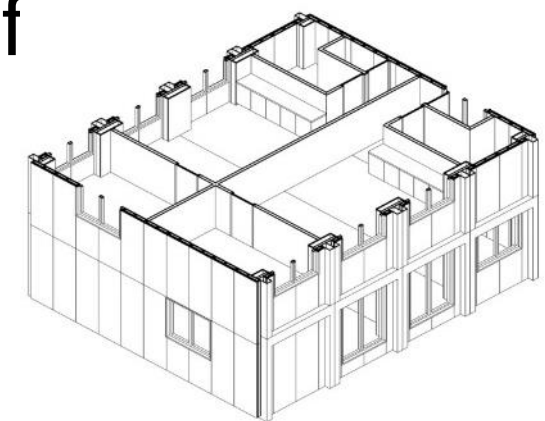
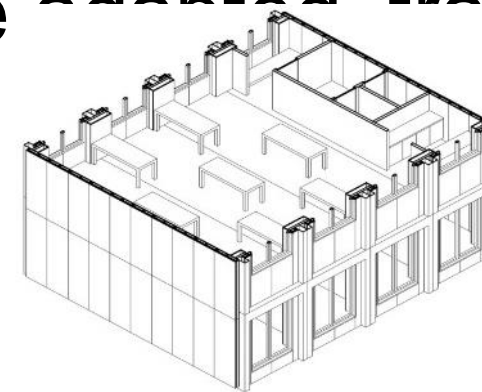
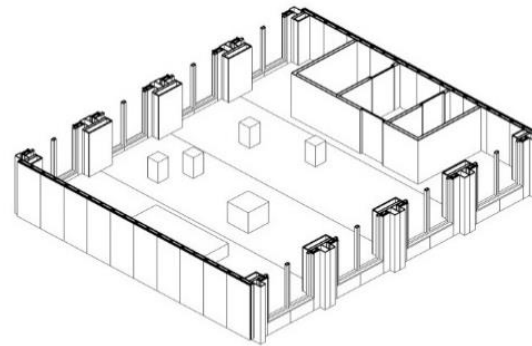
- Reversible design is a design strategy and approach that enables to design building so that can easily be adapted, transformed and dissambled:
- Building level
  - System level
  - Product level
- 
- The image contains two identical exploded view diagrams of a building facade system, illustrating the hierarchy of reversible design. Each diagram shows a multi-layered structure with components separated to show their assembly. The layers, from top to bottom, are: a green translucent layer, a grey translucent layer, a yellow translucent layer, a white frame, and a base structure. To the right of each diagram is a legend with labels: 'Green wall', 'Grey wall', 'Yellow wall', 'Frame', 'Coffey wall', 'Honeycomb wall', 'Floor wall', and 'Honeycomb wall'. The diagrams show how these components are assembled into a complete facade system.



# REVERSIBLE BUILDING DESIGN

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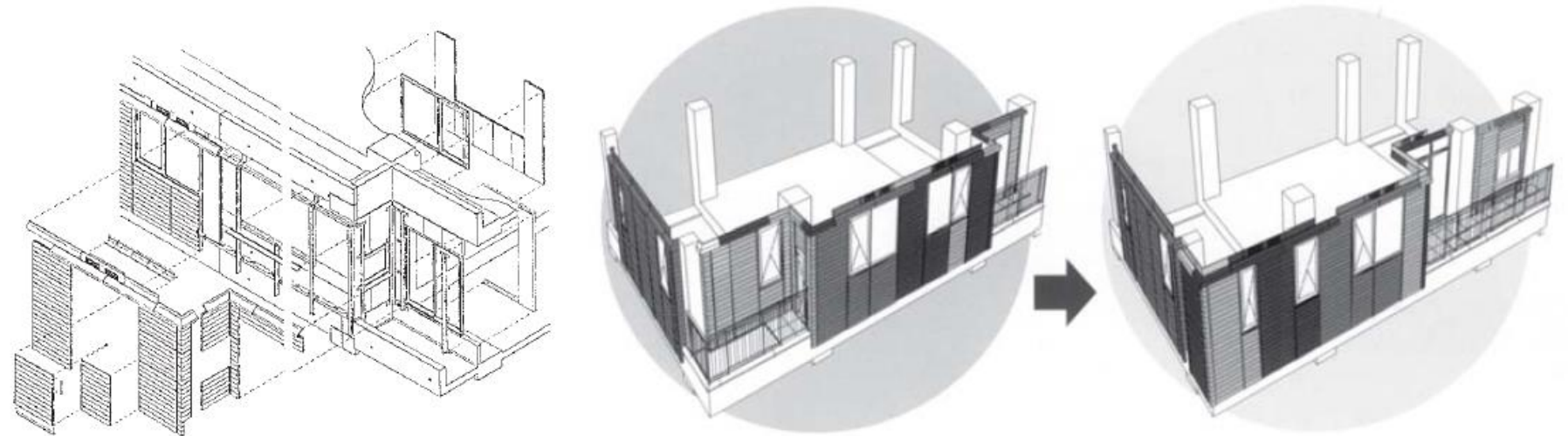
*Retrofit Lab – transformation scenario's*

**Increase flexibility, quality of use, comfort, ease of maintenance and refurbishment.**



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- Product level

Status Quo:	BAMB / Cradle to Cradle® Alternative:
 <p>• <u>Problemstellung:</u></p> <ul style="list-style-type: none"> <li>• nichtlösbarer Materialverbund</li> <li>• Gips schränkt Rezyklierbarkeit von Betonbruch ein</li> <li>• Sulfatreiben</li> </ul>	   <p>• <u>Lösungsansatz:</u></p> <ol style="list-style-type: none"> <li>1. Verzicht auf Putz</li> <li>2. Vorsatzschale im Trockenbau</li> <li>3. Putz auf Trennschicht (z.B.: Folie)</li> </ol>

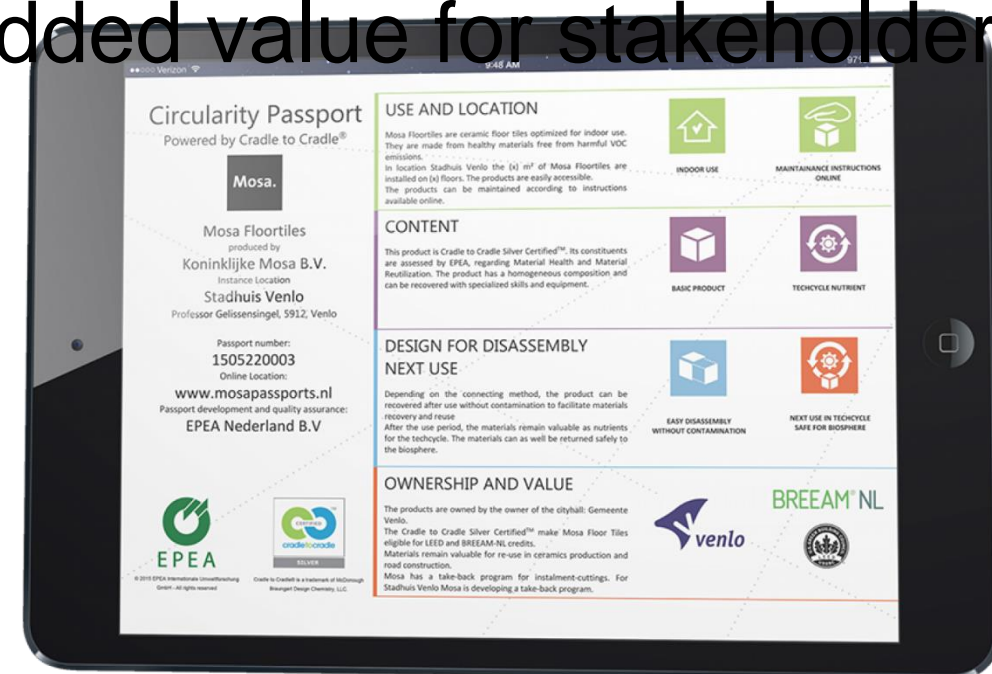
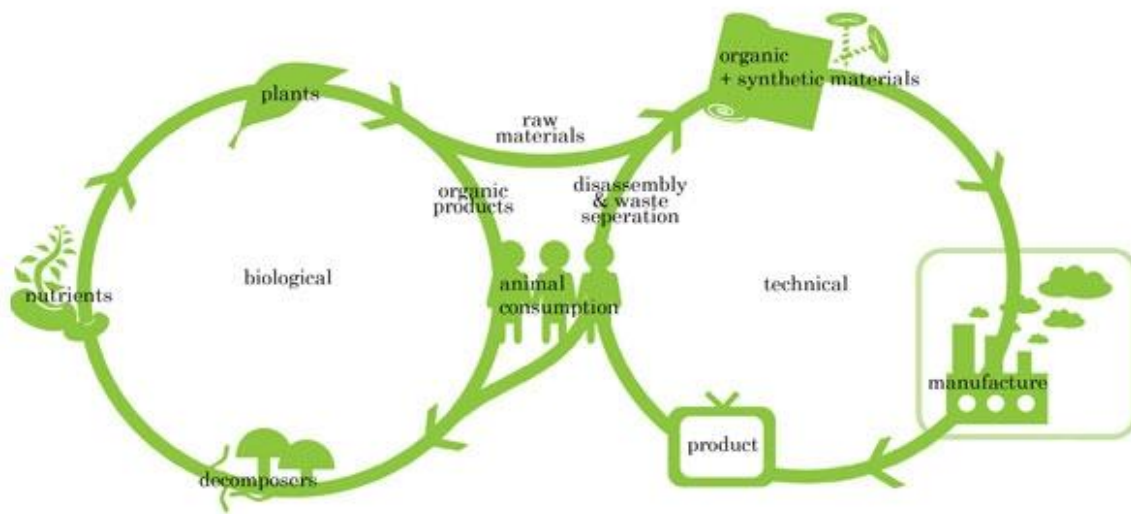
*New Office Building – Increasing the recycling potential of concrete*

Supporting clean fractions and increasing the re-use and recycling potential

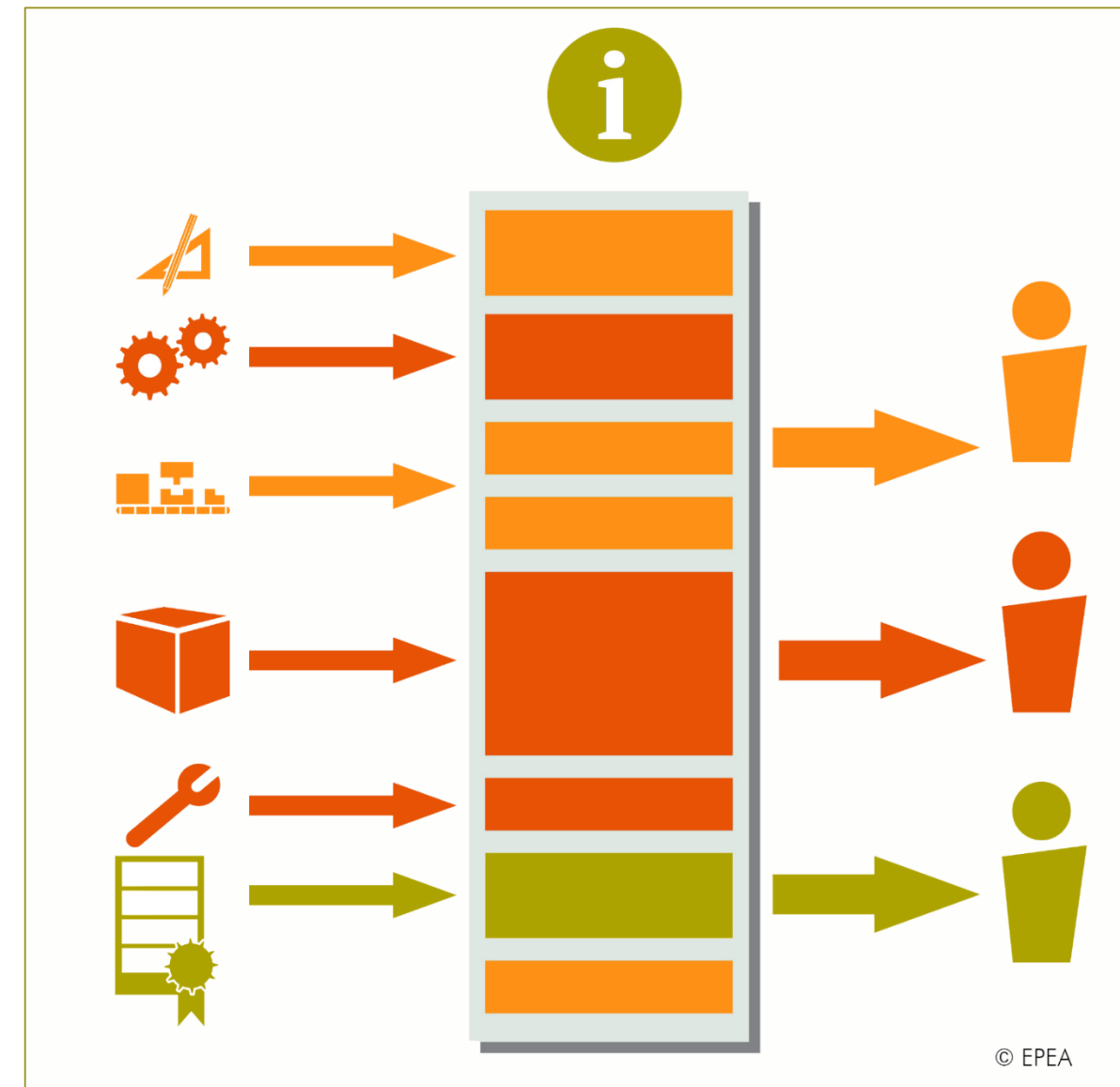
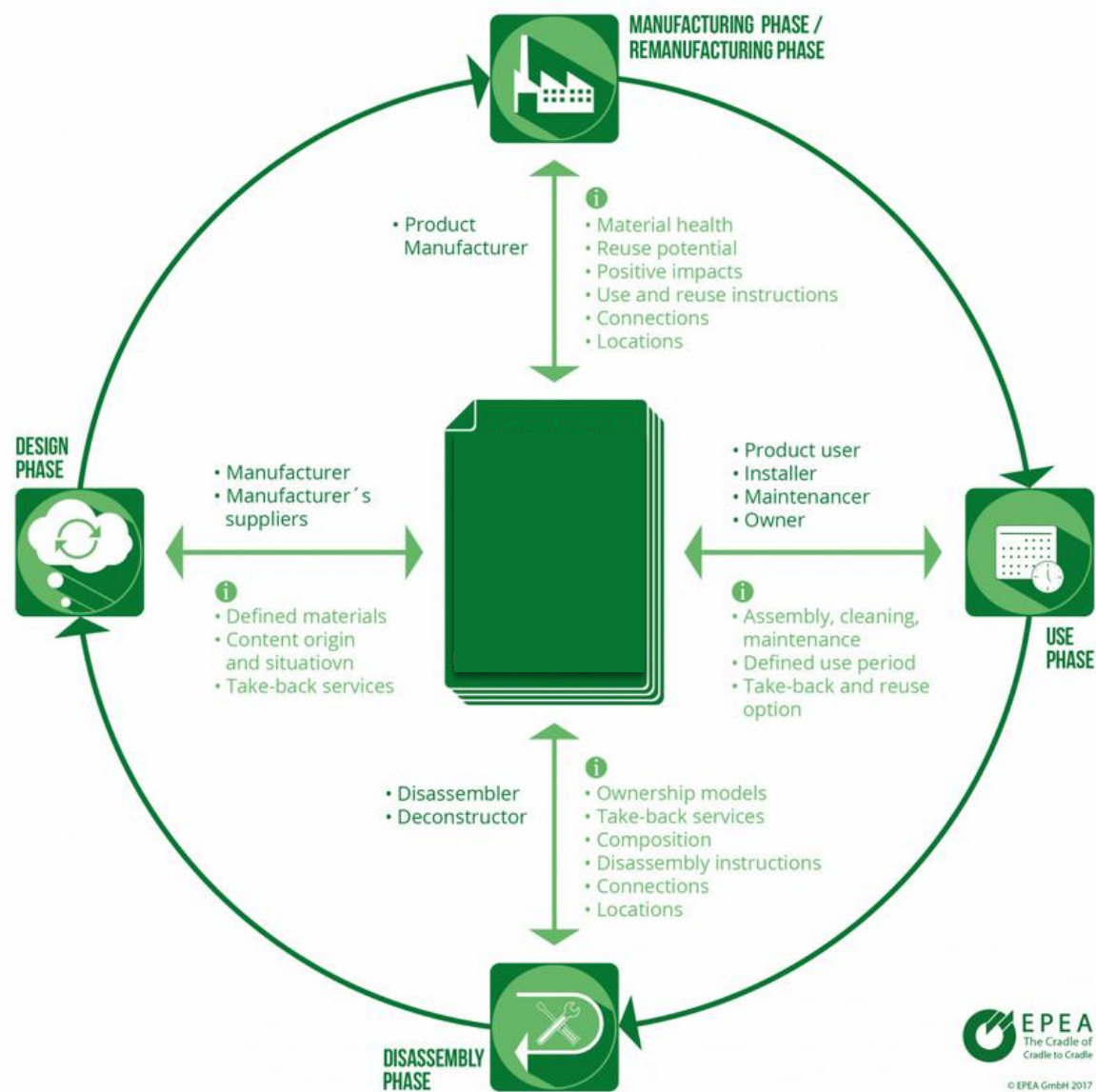


# MATERIALS PASSPORTS

- Materials passports (MP) are electronic sets of information describing defined characteristics of building materials, products, and systems which make them suitable for resource recovery and re-use.
- They describe the value for recovery and re-use of buildings materials in ways which allocate added value for stakeholders



# MATERIALS PASSPORTS

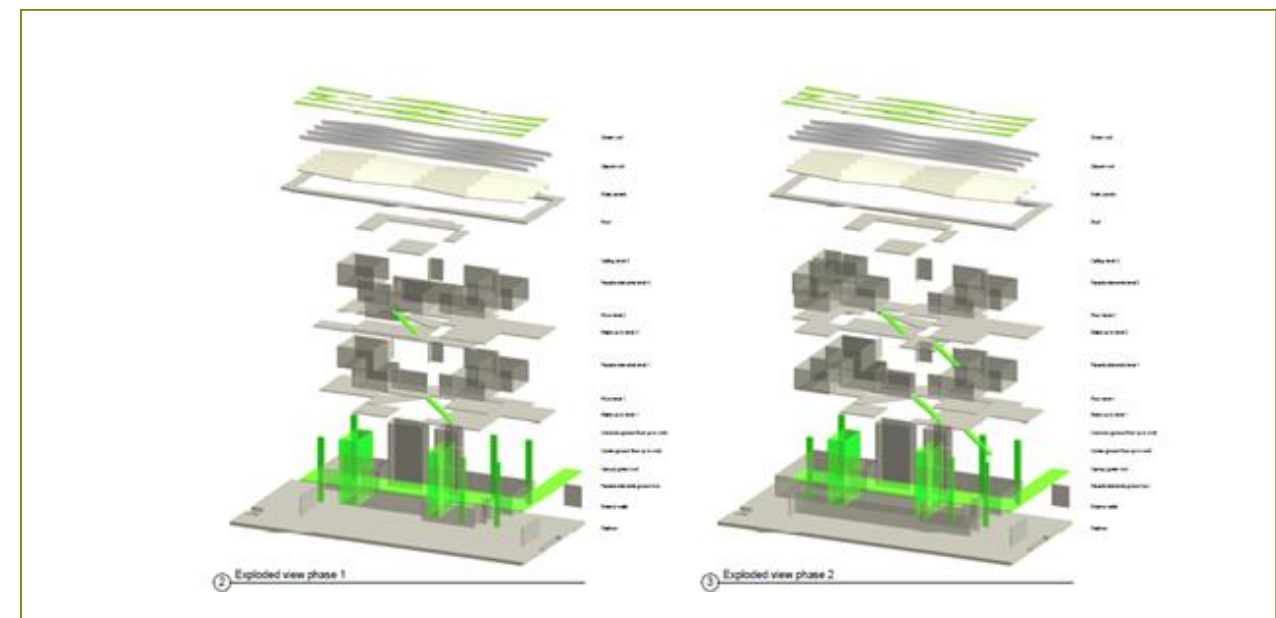
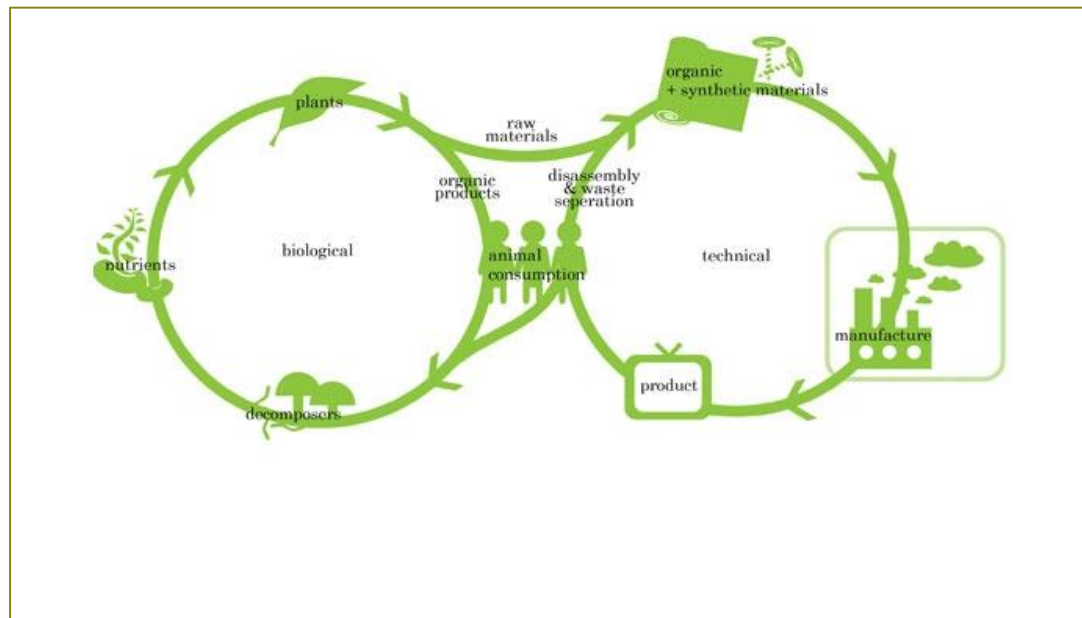




# RE-THINKING THE DESIGN AND BUILDING VALUE

## CHAIN Material Passports

## Reversible Building Design




## Transition – Change

3.  
Data management  
(including BIM)



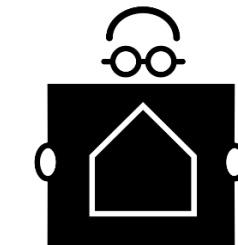
4.  
Business Models



5.  
Policies and Standards



# BUILDING INFORMATION MANAGEMENT



Created by Joel Burke  
from Noun Project



Created by Wilson Joseph  
from Noun Project



Created by Vectors Market  
from Noun Project



Created by Gregor Črešnar  
from Noun Project

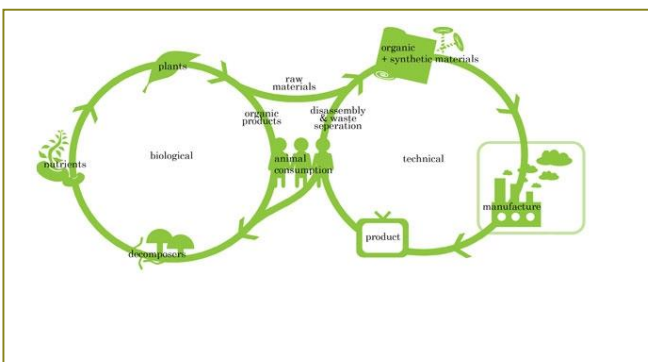


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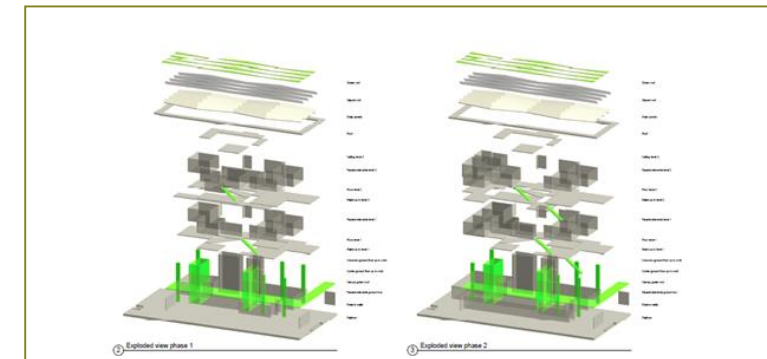


# BUILDING INFORMATION MANAGEMENT

## Material Passports



## Reversible Building Design



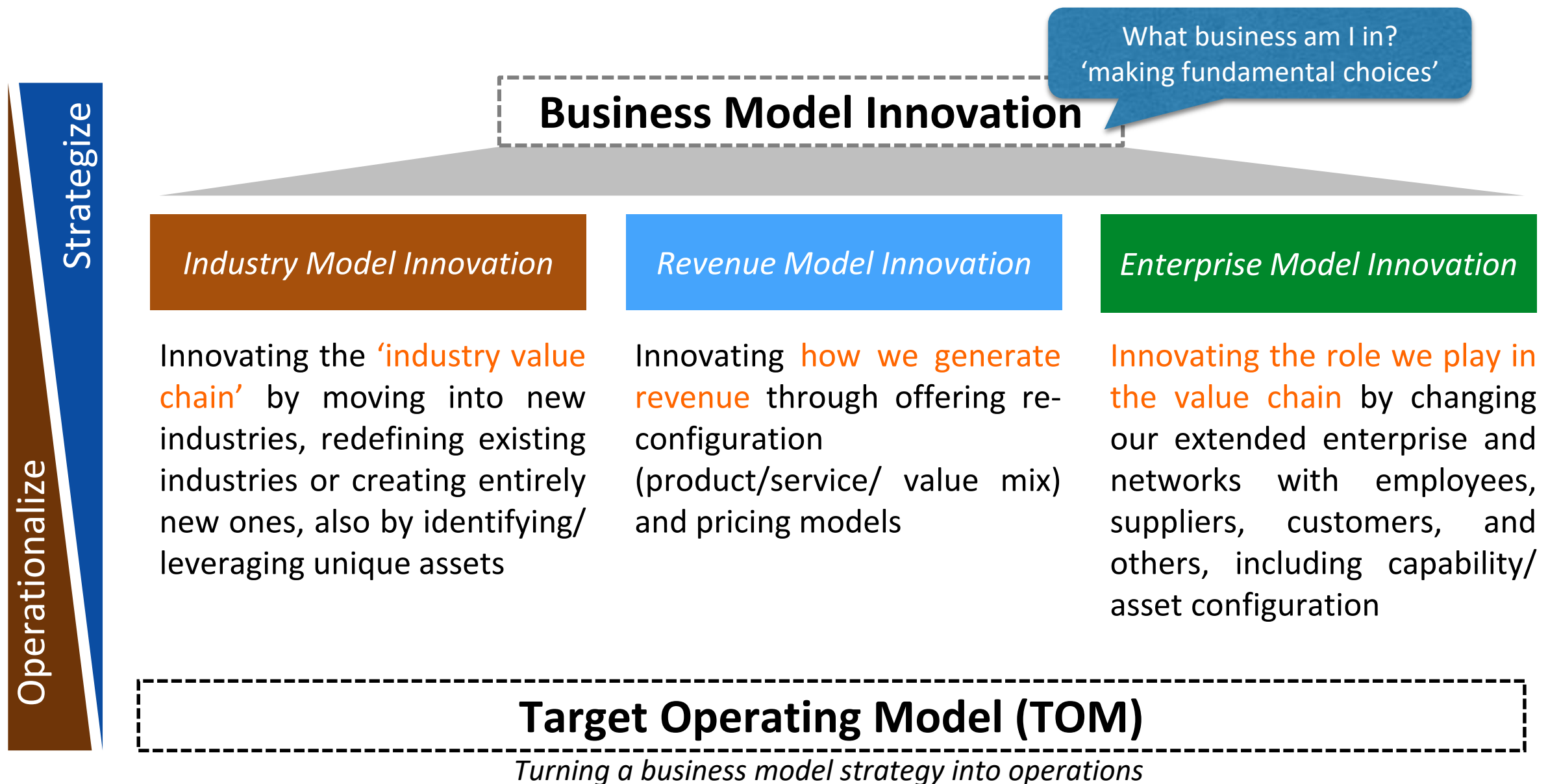
## Environmental Impact assessment

## Life Cycle Costing

- Building Level Integrated Decision Making Model
- BIM Resource Productivity Prototype

# BUSINESS MODELS

When innovating the business model in the digital era, 3 dimensions need to be managed





## POLICIES & STANDARDS

Analysis of the state-of-the-art and opportunities and barriers

Impact analysis

Best practices

Learning from the pilot projects and stakeholders



Suggestions for policy recommendations (new policies and adaptations)



# IMPLEMENTATION & REPLICABILITY



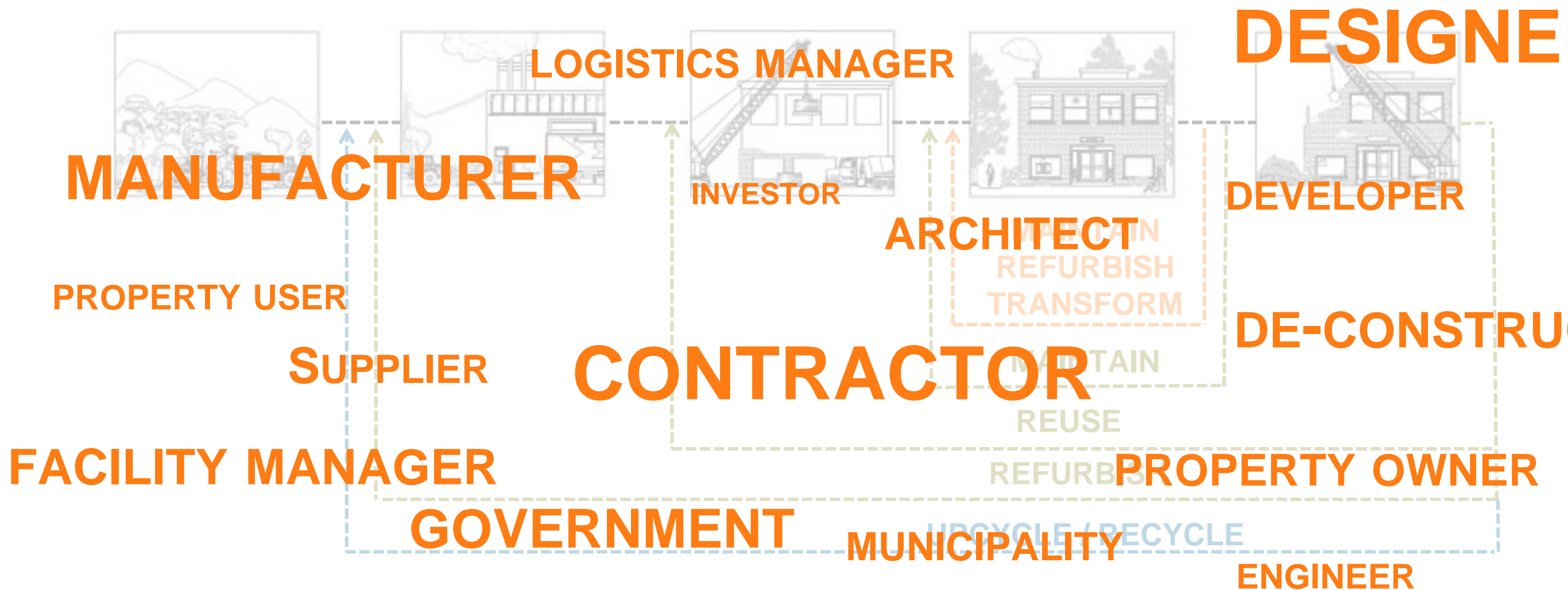
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# RE-THINKING THE DESIGN AND BUILDING VALUE CHAIN

Towards a circular and dynamic building design



# SWIM and Horizon 2020 Support Mechanism

Working for a Sustainable Mediterranean, Caring for our Future

Thank you for your attention.

[www.bamb2020.eu](http://www.bamb2020.eu)



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