

RESOURCE  
ACQUISITION

MANUFACTURE

PACKAGING AND  
TRANSPORTATION

USE

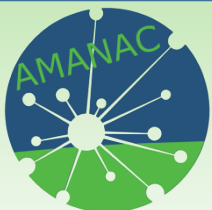
END-OF-LIFE



# LIFE CYCLE THINKING IN THE CIRCULAR ECONOMY



Dr. Federico Cartasegna  
(ENVIRONMENT PARK S.p.A.)



# AMANAC – CSA LCA Workshop



## WHAT IS CIRCULAR ECONOMY?



CLOSING  
THE LOOP



EC circular economy factsheet



# AMANAC – CSA LCA Workshop



## DEFINITION OF CIRCULAR ECONOMY

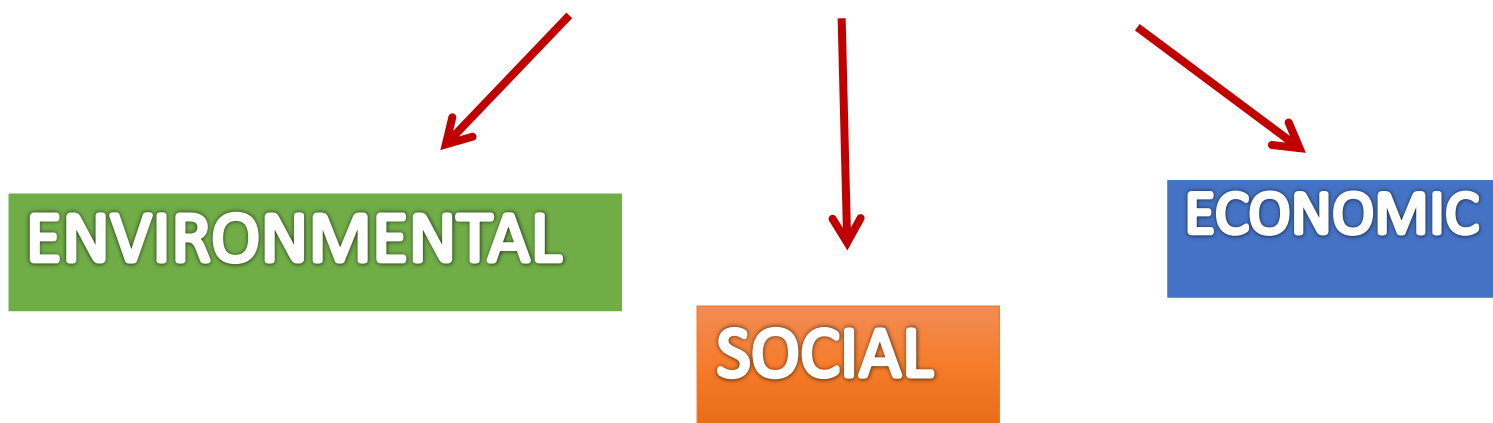
“Circular Economy refers to an industrial economy that is restorative by intention;  
aims to rely on renewable energy;  
minimizes, tracks, and hopefully eliminates the use of toxic chemicals;  
and eradicates waste through careful design”

[Ellen Mac Arthur Foundation, 2014]

## DEFINITION OF CIRCULAR ECONOMY

A circular economy ensures that **value is maintained** within a product when it reaches the **end of its useful life** while at the same time **reducing or eliminating waste**.

This idea is fundamental to the **triple-bottom-line concept of sustainability**, interplay between FACTORS:

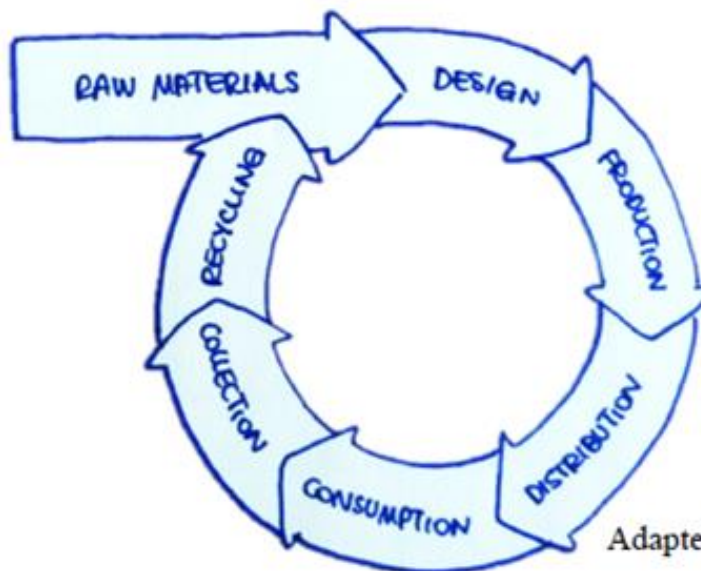


## FROM LINEAR



## TO CIRCULAR

intelligent design leads to products or their parts being repaired, reused, returned and recycled



Adapted from: COM 2014/398/EC



# AMANAC – CSA LCA Workshop



## The European Commission adopted an ambitious **Circular Economy Package**

A programme of action, with measures covering the whole cycle: from production and consumption to waste management and the market for secondary raw materials



# AMANAC – CSA LCA Workshop



## Circular Economy Package

### REVISED legislative proposal on waste

- A common EU target for recycling 65% of municipal waste by 2030;
- A common EU target for recycling 75% of packaging waste by 2030;
- A binding landfill target to reduce landfill to maximum of 10% of municipal waste by 2030;
- A ban on landfilling of separately collected waste;
- Promotion of economic instruments to discourage landfilling ;
- Simplified and improved definitions and harmonised calculation methods for recycling rates throughout the EU;
- Concrete measures to promote re-use and stimulate industrial symbiosis - turning one industry's by-product into another industry's raw material;
- Economic incentives for producers to put greener products on the market and support recovery and recycling schemes (eg for packaging, batteries, electric and electronic equipments, vehicles).





# AMANAC – CSA LCA Workshop



## CLOSING THE LOOP IS NOT ALWAYS THE BEST OPTION

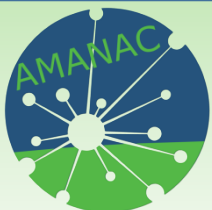
Although the idea is inspiring, there's still no clear view about how to transform circular economy into mainstream practice.

We need to make sure that circular economy thinking will actually reduce the negative environmental and social impacts of products.



## COMPLEMENTING CIRCULAR ECONOMY WITH LCA





# AMANAC – CSA LCA Workshop



## COMPLEMENTING CIRCULAR ECONOMY WITH LCA

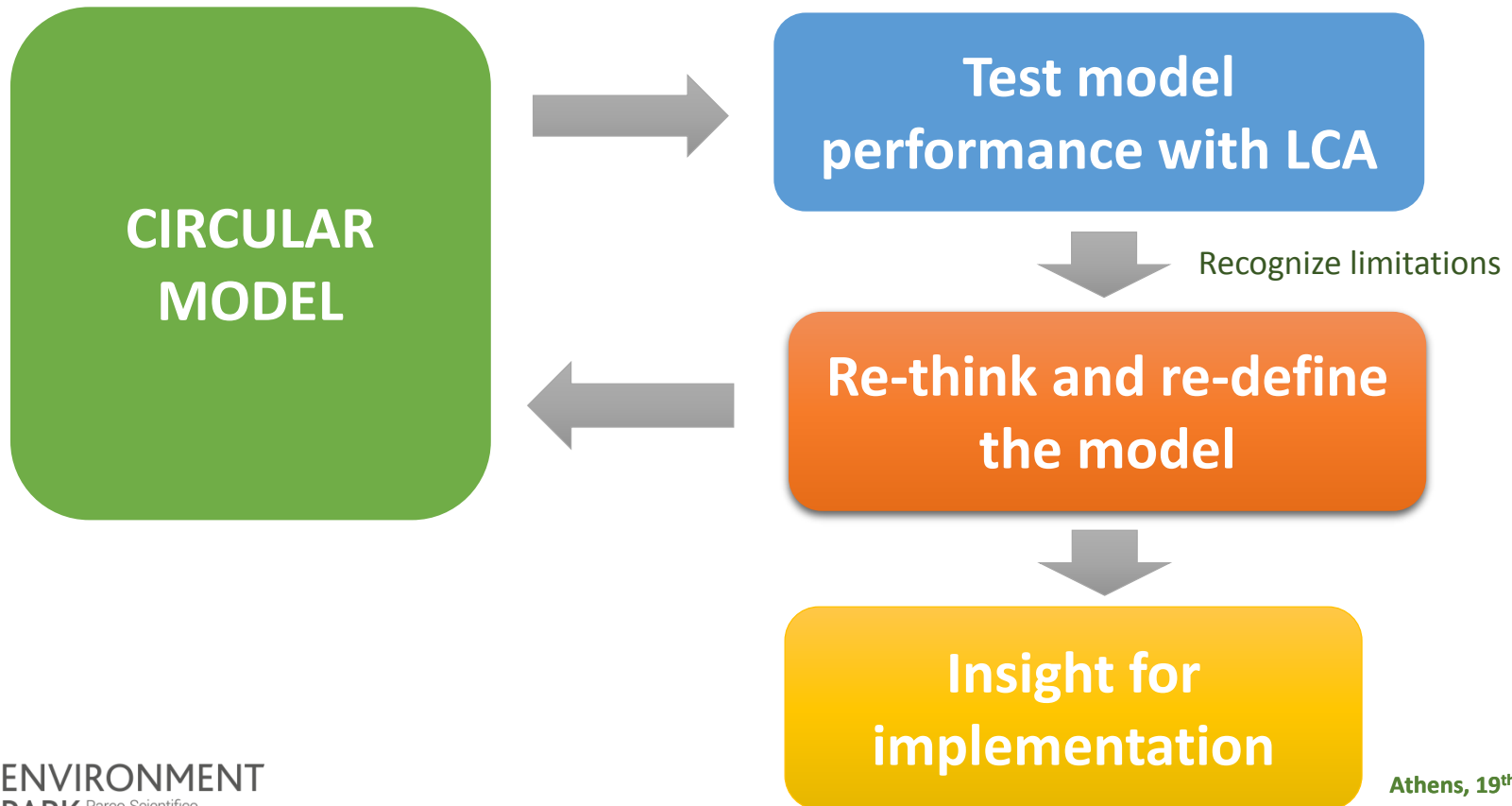
To evaluate the impacts of the circular economy, applying a life cycle approach is highly beneficial. LCA can strengthen the propositions of circular economy, and the other way around.

LCA is a robust and science-based tool to **measure the impacts** of the new circular economy products and business models.

**WITHOUT A LIFE CYCLE APPROACH, IT IS  
IMPOSSIBLE TO HAVE A GENUINE  
CIRCULAR ECONOMY.**

## COMPLEMENTING CIRCULAR ECONOMY WITH LCA

Testing CE model performance



## COMPLEMENTING CIRCULAR ECONOMY WITH LCA

### Example of implementation strategy

- Route to circularity is a **continuous process**
- Starts at product/operational level in business
- **Prioritize actions** (one step at a time, with a roadmap in mind)
- Set **Key Performance Indicators** (KPI) and measure progress over time
- Set **targets**
- **Feed back** the model





# AMANAC – CSA LCA Workshop



## LIFE CYCLE THINKING: THE BEST OF BOTH APPROACH

Examples of some key best practice

**REDUCE** the weight of  
products, and therefore  
the amount of material  
used

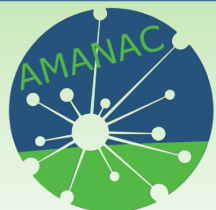


Less raw materials  
and energy for the  
production and  
transport

**REPAIR**



Extend the usable  
lifetime of products



# AMANAC – CSA LCA Workshop



**REUSE** of products (or components)



Spread the impact of a product (or a component) to different use cycles

**REMANUFACTURE** when possible, restore durable products to **like-new** conditions



Reduce impacts by making **new** products with existing components



# AMANAC – CSA LCA Workshop

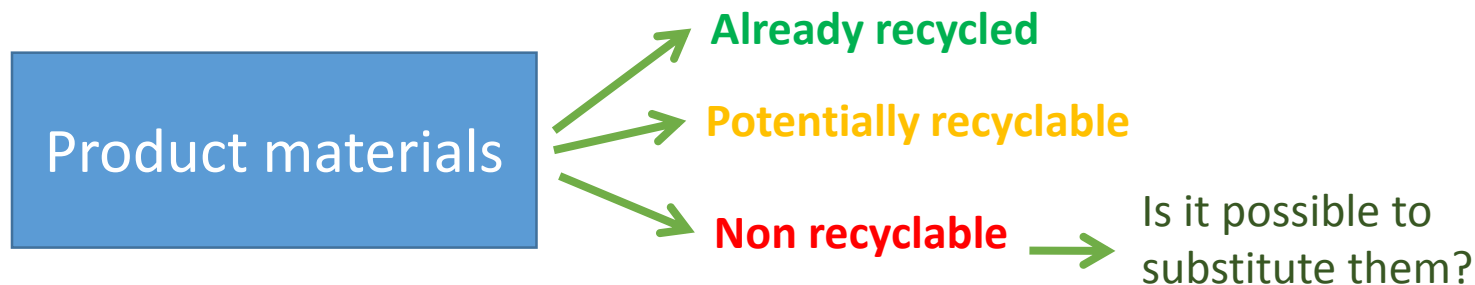


**RECYCLE** of materials



Close the loop of raw material

**An existing product can be analysed from recyclability point of view in order to reduce waste at the end of life**





# AMANAC – CSA LCA Workshop



## CIRCULAR ECONOMY IN THE CONSTRUCTION SECTOR

Challenges:

1. **Recycling** requires **collaboration** between operators throughout the value chain
2. Ensuring a reliable supply of **high-quality recycled** materials
3. **Deconstruction** should become a **main stream**, facilitated by practice in **building design**





# AMANAC – CSA LCA Workshop



## CIRCULAR ECONOMY IN THE CONSTRUCTION SECTOR

From the **construction product** side:

- Strengthen the life cycle thinking: consider the **whole life cycle of a product**, including EoL
- Apply for **harmonised communication procedures** (ex. EPDs)
- Maximisation of “recycling” and **minimisation of landfill starting from product design**



# AMANAC – CSA LCA Workshop

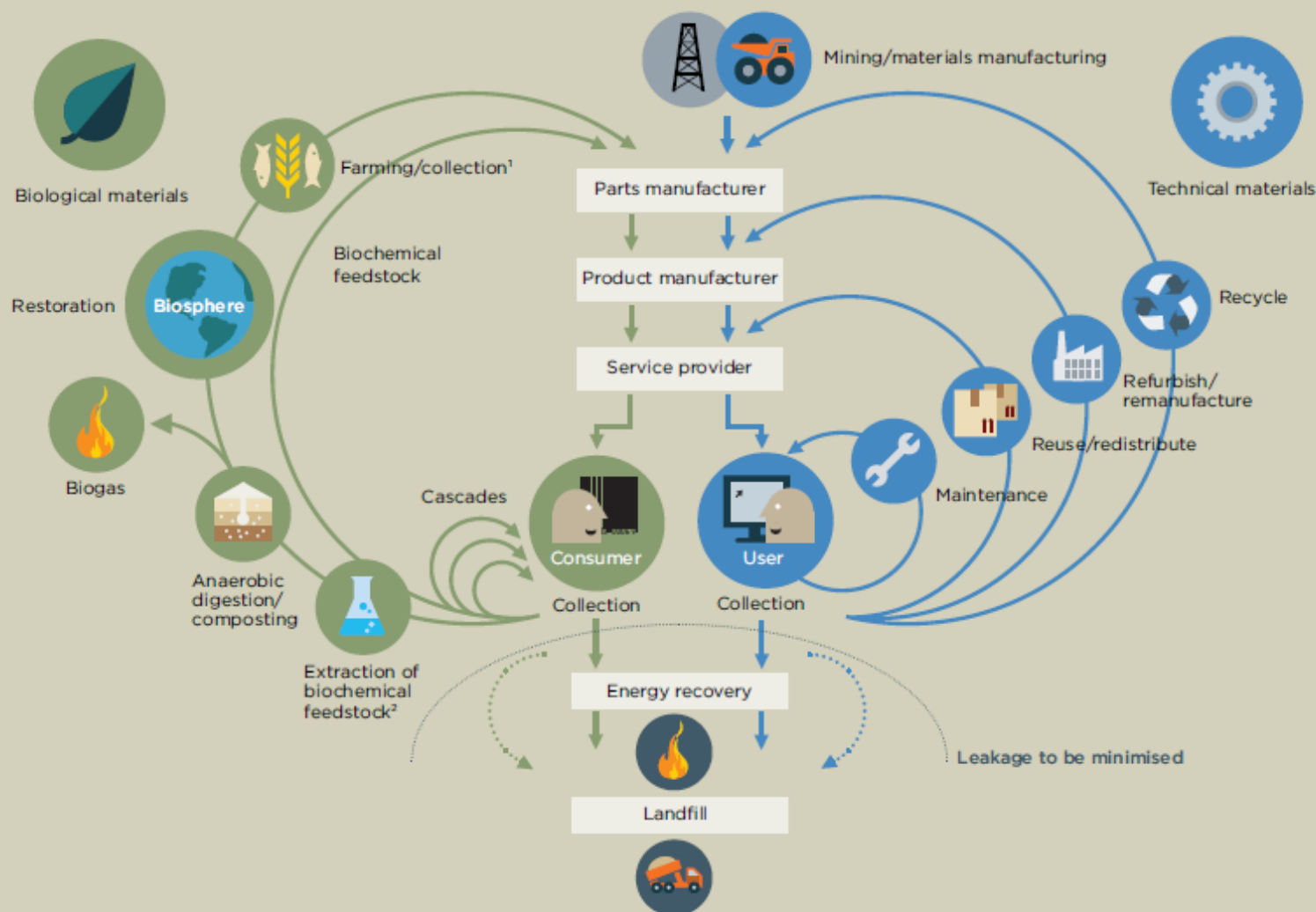


## CONCLUSIONS

life cycle thinking can promote a more sustainable rate of production and consumption and help us **use our** limited financial and natural **resources more effectively**.

We can derive **increased value from money invested** – such as wealth creation, accessibility to wealth, health and safety conditions, and fewer environmental impacts – by optimising output and deriving more benefit from the time, money, and materials we use.

FIGURE 2 The circular economy—an industrial system that is restorative by design



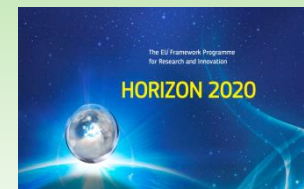
<sup>1</sup> Hunting and fishing

<sup>2</sup> Can take both post-harvest and post-consumer waste as an input

SOURCE: Ellen MacArthur Foundation - Adapted from the Cradle to Cradle Design Protocol by Braungart & McDonough



# AMANAC – CSA LCA Workshop



THANK YOU

Federico Cartasegna  
[federico.cartasegna@envipark.com](mailto:federico.cartasegna@envipark.com)  
[www.envipark.com](http://www.envipark.com)