Coupling Business Models with Life Cycle Assessment for 2\textsuperscript{nd} Life Applications: Advantages and Limitations

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Introduction

• Rising environmental concerns since the 1990s (Kyoto Protocol, IPPC’s conclusions, negotiations of a global agreement on greenhouse gases emissions reduction)
  ➤ Increasing attention on environmental impacts of production activities and search for sustainable development models
  ➤ Fostering product reuse, second life applications and recycling

• LCA and BM approaches may support the reflection towards more sustainable models of production
1- Weaknesses of BM approach

Traditional BM approach describes how value is created and captured

However:

1. **Environmental value** is not taken into account in value (product or use)
   - *Environmental impacts of production activities are scarcely analyzed*

2. Analysis mainly done at a company level
   - *2nd applications are not necessarily produced by the same firm that provided the first ones
   - *2nd applications need to introduce new actors, sometimes a completely new branch of activities into the analysis*

NB: Interesting new perspectives offered by open BM
2- Weaknesses of LCA approach

The LCA approach enables to identify environmental impacts through the identification of resource and energy consumption as well as waste production and elementary flows

However:

1. A restricted view of economic impacts
   - The economic dimension of activity is reduced to costs

2. A fuzzy perimeter of activities and of the actors’ network, due to the introduction of $2^{\text{nd}}$ life applications
   - The functional unit, at the core of LCA, becomes difficult to define

3. A difficult allocation of environmental impacts between several product lives
3- A BM approach to improve LCA

- A deeper analysis of economic issues
- A contribution of open BM to identify actors involved in 2\textsuperscript{nd} life applications
- A new conception of the life cycle model, able to allocate environmental impacts to several product applications
4- Using LCA in BM approach

• Internalizing the environmental impact of economic activities by introducing environmental value

• Introducing a global vision of the product life cycle in and going beyond a linear vision of sequential BMs in favor of a systemic and circular vision

Consequences:

1. Embracing potentially different fields of application, different actors

2. Challenging actors of the 1st life and questioning their ability to capture the 2nd life value of a product partially created in the 1st life
Conclusion

5 scenarii of Sustainable BM

- **Case 1**: Electro-Mobility → Degraded mode of Electro-Mobility → Recycling
- **Case 2**: Electro-Mobility → Home or Building Management System → Recycling
- **Case 3**: Electro-Mobility → Energy Storage System (dedicated to multiple uses) → Recycling
- **Case 4**: Electro-Mobility → Energy Storage System (only GtoV) → Home or Building Management System → Energy Storage System (dedicated to multiple uses) → Recycling
- **Case 5**: Electro-Mobility → Home / Building Management System → Energy Storage System (dedicated to multiple uses) → Home or Building Management System → Recycling

**Sequential vs. Non-sequential**
- **Sequential**: Same actors
- **Non-sequential**: Different actors, outsiders
Thank You