Introduction to the symposium: Life Cycle Assessment, in-between Research, standards, regulations and application

Anne Ventura

Université Nantes-Angers-Le Mans (LUNAM), Institut Français Sciences et Technologies Transport Aménagement Réseaux (IFSTTAR), Département Matériaux, F-44341 Bouguenais, France

1. INTRODUCTION

LCA is an exciting method. One can appropriate its aims, its main concepts and interests very rapidly. However, every person that is curious enough, when conducting its first LCA study, will inevitably meet vast questions that can range from ethics and philosophy, to physics, economics or mathematics. This person will progressively have to shift from the “studying-man” to the “decision-maker”, choosing between a full range of numerous options and hypothesis, and may then feel as the loneliest person on Earth.

2. LCA, A PARTICULAR METHOD

One of the particularities of LCA as a research field is the strong relationship between research, standards and regulations.

This is linked to the history of the method: before it became a full research domain, it was first introduced and used by industries, the method was then standardized in cooperation with researchers, and the standard itself, giving basic principles, has lead to many new research developments. This is indeed original: in many other scientific domains (i.e. construction materials), standards are often posterior to scientific advances.

LCA method has been qualified by authorities of industrialized countries as one that cannot be ignored to meet the stakes of sustainable development. In Europe, the Integrated Product Policy, since 2003, asserts that global environmental impacts should be better controlled by considering products’ life cycle than by considering impacts of industrial activities separately. This policy notably led to the European Platform of LCA. The United Nations have also appropriated the problematic, and have impulsered the UNEP-SETAC Life Cycle Initiative.

_De facto_, LCA researchers are often solicited by authorities or industries to perform studies or critical reviews, to contribute to standardization, to help decision-makers.

Another particularity of LCA is its transdisciplinarity characteristic. It aims at integrating the best available knowledge in interested disciplines. Many of them are concerned: physics and chemistry, process engineering, ecotoxicology, health, economics, social sciences, ecology, statistics…
Any LCA study also requires solid knowledge in its application field to define proper objectives, functional units and systems. Thus, any good LCA study should never be a lonely work.

3. LCA AND KNOWLEDGE TRANSFER

Thus, LCA is a widely used method, however many debates on the method itself are still occurring in the scientific community. LCA is a “learn while you run” method. It is thus important to use the method with discernment, well knowing the advantages and the limits. And this discernment will often concern the questions that the method is suitable to answer, and what to do with its results.

In that context, knowledge transfer from researchers to users and decision-makers is an absolute necessity.

In more “classical domains” standards play that role by giving accurate and detailed requirements to users, issued from recommendations of experts. In LCA, standards mainly contain general principles; these are issued from negotiations between stakeholders, according to their economic context, and basically not from pure scientific requirements, i.e. LCA basically integrates the notion of reasonable costs in time spending and financial efforts.

One of the main routes to knowledge transfer in LCA is the development of software tools and databases. More and more specific softwares and databases are developed in parallel with generic LCA ones. This reveals that each domain, such as construction, have specific needs for data and for parametrization.

4. LCA AND CONSTRUCTION

Constructed objects are long life time products, in constant interaction with their environment and, during their use or at their end of life, they generate huge amounts of wastes. Furthermore, decisional processes before the initial construction phase are regulated, multi-steps, multi-actors and multi-stakes. These particularities lead to methodological challenges. Among these, one could cite the followings ones.
- How to model the use phase for LCA in strong link with localisation? How to early estimate delayed and localized environmental impacts?
- Are LCA results responding to stakes of the regulated steps of the decision processes, or in the other sense, could decisional processes be regulated in accordance with informations given by LCA?
- What are the environmental impacts of a new construction in an existing constructed environment?

4. CONCLUSION

As LCA has become a vast “world” in itself, many “small worlds” are logically growing inside, as necessary specializations to improve environmental performances at every possible level with the best accuracy. These “worlds” have to meet themselves, exchanges are necessary to improve knowledges and practices in the same direction.

The international symposium on LCA and construction is one of the possible ways to favor these exchanges.