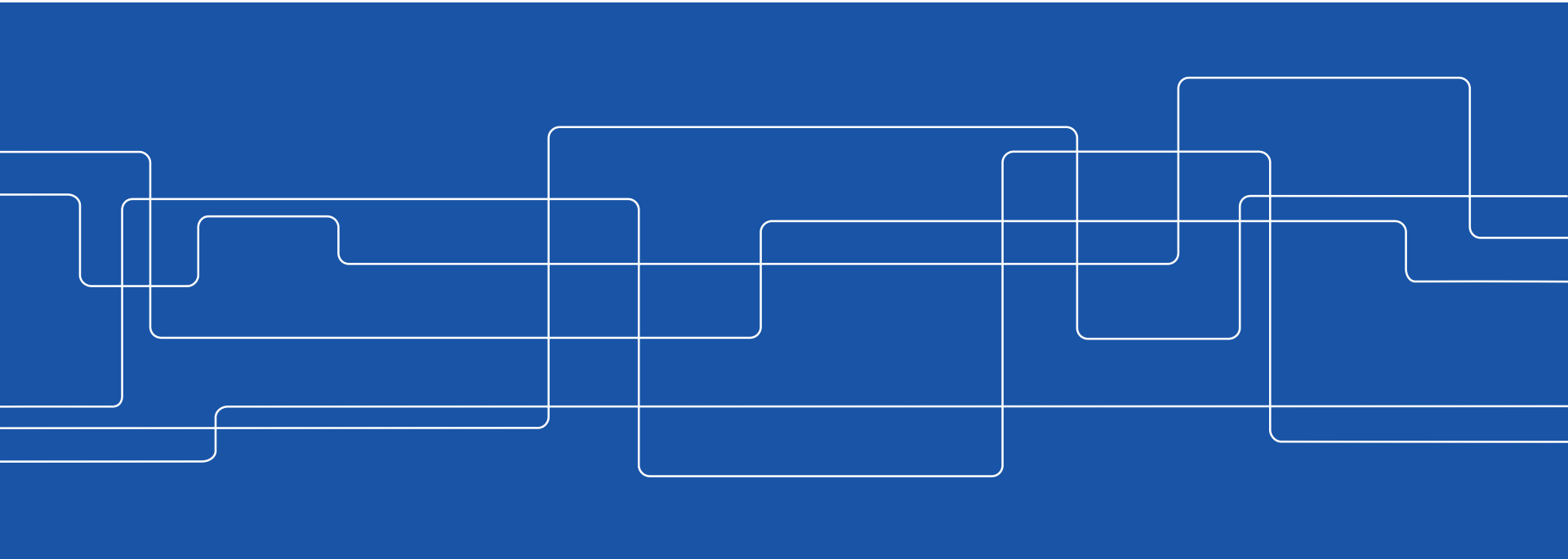




Some common misunderstandings on Attributional LCA

Göran Finnveden

Professor Environmental Strategic Analysis





Definitions from Finnveden et al (2009)

Attributional LCA (ALCA) is defined by its focus on describing the environmentally relevant physical flows to and from a life cycle and its subsystems.

Consequential LCA (CLCA) is defined by its aim to describe how environmentally relevant flows will change in response to possible decisions (Curran et al., 2005).



Misunderstanding 1: The 100% assumption

It is often suggested that

“LCA results of all the products in the world should add up to the total environmental impact in the world.” (Tillman, 2000).



Why the 100% assumption is a misunderstanding

Consider the example of Diesel fuel.

We can do an ALCA of Diesel fuel.

If we do an ALCA of a truck, we will include the use phase, i.e. we will include the Diesel fuel.

If we do an ALCA of a waste management system, and there is a truck transporting waste, we will again include the Diesel fuel.

So, already this example, shows that the Diesel fuel will be counted several times. Thus, the 100% assumption is not correct, if we add all ALCAs the result will be much larger.

Misunderstanding 2: ALCA is not relevant

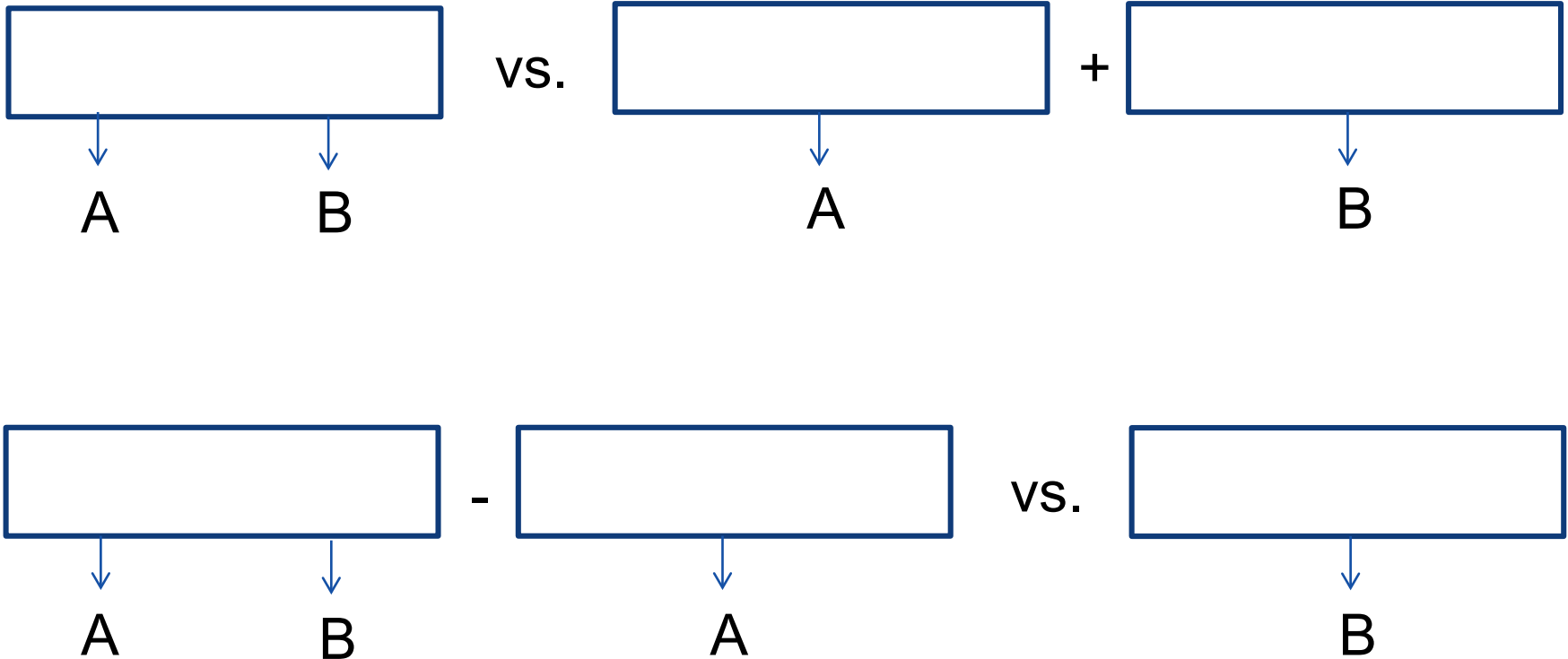
“The reason to perform an LCA is essentially to use it in support of a decision. A decision gives rise to a change somewhere in society compared to a scenario in which this decision was not taken. The key requirement for the LCA in any application is therefore, that it shall reflect the environmental change caused by the decision.” (Wenzel, 1998)



Why ALCA can be relevant

- LCAs are often used for other purposes, e.g. learning.
- Consequentialism is one approach for decision-making. There may be others (e.g. "choose the product with the lowest environmental impacts") which also are valid (c.f. Ekvall et al, 2005)

Misunderstanding 3: System expansion cannot be used in ALCA



Why system expansion can be used in ALCA

- System expansion is often used in practise (e.g. for waste management systems (Heijungs and Guinee 2007)).
- A practitioner is free to choose the functional unit. So there is no restriction to choose $A+B$ as the functional unit (e.g. taking care of waste and producing electricity).
- The "added" and "subtracted" systems provide identical results in qualitative terms. It therefore seems reasonable to accept both if one of them.
- There is no rule for not accepting system expansion i ALCA.

Potential misunderstanding 4: ALCA leads to more truncation errors than CLCA

- It is difficult to include all processes in an LCA. There will therefore be truncation errors.
- It is sometimes suggested that this is a larger problem for ALCA compared to CLCA.
- This is however a misunderstanding. It may be the other way around since Input-Output-based LCA avoids truncation errors and are more compatible with ALCA.



Potential misunderstanding 5: There is a clear connection between the goal and questions you ask in an LCA and the choice between ALCA and CLCA

- This is something we often say. But in practise it is very difficult to describe this connection.



Potential misunderstanding 6: There is a clear boundary between ALCA and CLCA

”Dividing the LCA world into CLCAs and ALCAs overlooks the studies in between and hampers a constructive dialog about the creative use of modelling frameworks” (Suh and Yang, 2014)



This is work in progress

I am happy to get comments.