Range of technology choices in life cycle assessment of environmental treatment technologies - DTU Orbit (23/12/2018)

**Range of technology choices in life cycle assessment of environmental treatment technologies: An example of a solid waste landfill model**

Limited data availability and local differences of environmental treatment technologies lead to the use of sub-optimal data and choices of single datasets, where multiple data choices may be representative. The use of data not representing the entire coverage of an LCA study can cause a bias in the result interpretation and limit the robustness of the results. The objective of this study is to demonstrate the relationship between the number of discrete data options and the goal and scope of the study. The importance of the spread in LCA results and how this spread influences the LCA result interpretation is assessed. The objective is obtained by performing a landfill model case study and presenting and discussing results relative to the specificity of the coverage of the study (see conceptual approach in Figure 1).

The outcomes shows a trend of decreasing LCA result ranges with increasing level of specification of the technological and geographical coverage of the study. For example, for global warming potential, the global maximum value is 2.6 times larger than the global minimum value and, for human toxicity, carcinogenic, the global maximum value is 45 times larger than the global minimum value. These ranges have the potential to significantly influence the LCA results, and are interpreted as potential magnitudes of errors introduced by the data choices. The results highlighted the pitfalls of choosing specific data to represent a generic process, and vice-versa. The former will lead to precise, but inaccurate results, whereas in the latter the obtained data represent a lower level of knowledge than the initial goal and scope.

To conclude, a detailed description of the coverage of the study and understanding of the technologies are necessary for representative life cycle inventory modelling. This conclusions was described in a step-wise approach for representative data choices and modelling. The outcomes shed light on the potential spread caused by discrete data choices in the modelling of environmental treatment technologies.

**General information**
State: Published
Organisations: Department of Environmental Engineering, Residual Resource Engineering
Contributors: Henriksen, T., Astrup, T. F., Damgaard, A.
Number of pages: 1
Publication date: 2016
Peer-reviewed: Yes
URLs:
http://www.sustain.dtu.dk/

**Bibliographical note**
Sustain Abstract A-1
Research output: Research - peer-review » Conference abstract for conference – Annual report year: 2016