LCA modelling of solid waste management systems

Time of the course

26 November 2012, 9:00-12:00

Instructor(s)

Anders Damgaard, DTU, Denmark

Introduction

Municipal solid waste management is an issue all nations face. With technological development and changes in consumption patterns the products and amounts being discarded are changing over time. This is further being complicated by the fact that a large amount of different materials are being mixed in the waste bin, and the disposal option that is ideal for one product will be less ideal for other products due to differences in physical or chemical composition.

This means that decision makers need to find ways to handle this mix of products in the overall most optimal way. LCA is increasingly being used as one of the tools to assess what the optimal ways for handling the waste products are. To ease the use of LCA for waste systems dedicated waste models are being developed to encompass the complexity in the handling of the waste products from a bin-to-grave point of view. We will explain the rationale behind these models and go over the different issues in technologies that are used for the treatment of the waste.

We begin by explaining basic concepts for waste modelling –generation rates, fractional composition and the associated chemical speciation. From here we cover the options for sorting of waste at households or at centralized facilities and how these choices interplay with the collection systems. We will discuss intermediate technologies for splitting or purification of materials, or utilization in some form (i.e. energy, materials or nutrient recovery) and the need for a final disposal option. The focus will throughout the course be on some of the pitfalls and issues that need to be considered when modelling the waste treatment, such as carbon accounting, time-scale issues and substitution of materials and energy.

Learning objectives
The aim of this course is to introduce participants to the LCA modelling of municipal solid waste (MSW) management systems and explain why dedicated LCA waste models are being developed to handle this area.

The participants will be introduced to different technologies for treatment of MSW and how they are modelled in a LCA perspective. Focus will be on issues of importance for a correct modelling of different waste types where physical and chemical speciation as well as the flow pathways plays a large role.

Participants will come away with knowledge of basic concepts of waste LCA modelling and what the critical modelling aspects are. The EASETECH model currently being developed at DTU Environment will be used to exemplify modelling aspects. It is expected that the course participants have a general understanding of LCA as the focus will be the interchange of waste and LCA.

Course content/programme
- Introduction and overview
- General introduction to waste LCA modelling: generation rates, fractional composition, chemical speciation.
- Sorting, collection and intermediate technologies
- Coffee break
- Energy: production, technologies, use and substitution.
- Final destination technologies: landfills/use-on-land. Carbon accounting, material substitution and time-scale issues.

Practicalities
There is no requirement to bring a laptop. If participants are interested in the EASETECH model there will be an option for following a course on this model around summer 2013. The course concepts are applicable in most LCA models.

Contact info
If you have questions specific to the content of the course, please contact Anders Damgaard (adam@env.dtu.dk). For questions related to registration and fees, please look at the Symposium website (http://lcacopenhagen.setac.eu/) or contact the SETAC Europe office (valerie.verstappen@setac.org).