

LIFE CYCLE ASSESSMENT (LCA) OF WASTE MANAGEMENT SYSTEMS

Life Cycle Oriented Waste Management Systems Model - EASEWASTE

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The household (municipal) solid waste and the environmental consequences associated with its management have received increasing attention in industrialized countries during the last couple of years and waste management has gone through a history of shifting problems, demands, and strategies over the years and now waste is viewed as a problem ranging from local to global concern. Decisive for this view has been society's increasing complexity and thus the increasing complexity of waste, together with a general development of environmental consciousness, moving from local focus on point emission sources, to regional and global issues of more complex nature.

The aim of the paper is to provide an understanding of the ecological (environmental) issues involved in waste management systems and the capacity of life cycle assessment techniques to address these issues through PC-based model. In order to enhance the development of sustainable solid waste management systems and to guide waste experts to adopt eco-efficiency and a life-cycle thinking into waste management systems, a new PC-based model (EASEWASTE) is developed.

The objective of the model is to evaluate the environmental performance of the various elements of existing or proposed solid waste management systems (residential, bulky and garden waste). Life Cycle Assessment is applied to quantify and qualify the resource and energy consumption /production and the emissions released from a waste management system. The model calculates environmental impacts potentials and resource consumptions for any user-defined waste treatment system and allows the user to track them to their source in a waste treatment processes or to a specific waste material fraction. The model also supports individual technology/process calculation of environmental impact potential for the user-defined waste system.

The model is designed to be flexible, transparent, user-friendly and well documented in order to ensure widespread use by local and regional waste planners, as well as by authorities setting guidelines and regulations. The model is already being applied in actual cases in Denmark and results obtained with the model have confirmed the importance of applying a systems perspective and of taking into account site specific differences in analysis and planning of waste management, rather than relying on overly simplified solutions.