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LCA – LIFE-CYCLE-ASSESSMENT MODELLING HAS COME TO STAY IN WASTE IN MANAGEMENT – BUT DOES IT ALSO PLAY A ROLE IN HAZARDOUS AND SPECIAL WASTE MANAGEMENT?

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Keywords: LCA, time issues,technology data, toxic and non-toxic impacts

Life-cycle-assessment modelling has become an integrated part of waste management. It is part of the Waste Directive and the EU JRC-IES has been issuing a detailed guideline on how LCA should be performed for waste management. A recent review of published LCA studies including more than 200 studies showed that many studies have been performed on alternative waste management of specific waste fractions but that also full waste management systems have been the subject of LCA studies in recent years. The review also revealed that many studies could be better conducted; in particular issues about technological assumptions, systems definition, use of external databases and issues about uncertainty could receive more focus. Nevertheless, LCA-studies on waste management have provided new insight into what matters from an environmental point of view in waste management: Which are the critical fractions in the waste and which are the technologies providing the best environmental profile. It has also shown that a single best technology or waste management system does not exist because the environmental profile depends so much on the actual waste composition, the technological level as well as on the exchanges with the surrounding society in terms of secondary materials and energy recovered.

The question is if LCA modelling also has a role to play in hazardous and special waste management. The number of studies available is limited and the presentations will address some key issues and features to pay attention to when LCA is used in hazardous and special waste management. The presentation will address these LCA issues with examples from management of hazardous air-pollution-control residues, paint waste and WEE not collected properly. The key issues are:

- The time issues. LCA usually work with a 100-year time horizon, while hazardous waste may have the potential to pollute the environment for thousands of years. If long time periods are employed it requires data representing such long time periods. For example leaching data must be developed representing a 1000 year time horizon.
- Technology data for rare elements. Hazardous materials and special waste from households constitute a separate problem if not collected separately. Quantifying in an LCA context what the hazards are if hazardous waste are managed with the solid waste requires that technology data are available for all the hazardous elements in the products improperly disposed off (e.g. rare elements in WEEE disposed with the municipal waste) as well as how these elements will behave when treated in conventional technologies
- The balance between toxic and non-toxic impacts. Hazardous waste per se is primarily characterized by its potential toxic impacts, while long-distance transport and many

treatment technologies are energy intensive and hence contribute significantly to the traditional impact categories as Global Warming and Acidification