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Life Cycle Costing for Solid Waste Management Systems in EASETECH

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Municipalities and private companies are responsible for managing household and commercial waste. To decide among various waste management options, data on both environmental and economic performances are needed. The purpose of this project is to implement the capability of performing cost assessment in addition to the LCA capabilities already included in the EASETECH model.

SETAC-Europe Working Group on Life Cycle Costing suggested life cycle costing (LCC) as a consistent framework with LCA. This investigation used the basis established by SETAC to develop further the LCC methodology to satisfy the specific needs of the waste management sector.

The proposed modelling framework distinguishes between: Conventional LCC; Environmental LCC and Societal LCC. Conventional and Environmental LCCs are both financial assessments that only include budget costs and transfers (market goods/services). But while Conventional LCCs exclude environmental impacts since they are not of interested for the decision-maker, the Environmental LCCs include them in a parallel LCA. Contrary, the Societal LCC is a welfare economic assessment that includes budget costs (market goods/services) as well as effects outside the economic system (externality costs). To perform each LCC, the model defines unit costs of each technology (per ton of input waste), which is afterwards combined with a mass balance to calculate the technology cost. Later, the costs of individual technologies can be combined to calculate the system or scenario costs (Figure 1).

The paper provides an overview of: 1) which cost items should be included in each LCC, 2) calculation principles and 3) cost data for Denmark in 2015. In addition, it demonstrates the applicability of the cost assessment model for solid waste management technologies and systems through a case study.

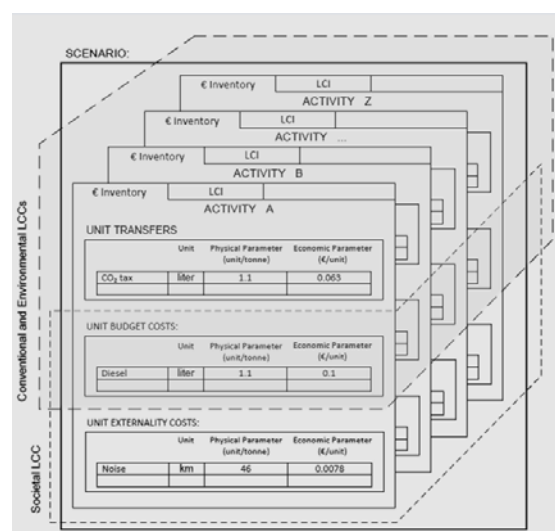


Figure 1: Overview of the cost model structure, illustrating a range of activities (A through Z) and the cost coverage of Conventional, Environmental and Societal LCCs from Martinez-Sanchez et al. (2015).ⁱ

Martinez-Sanchez, V., Kromann, M. A. & Astrup T.F. (2015) Life Cycle Costing of waste management systems: Overview, calculation principles and case studies. Waste Management 36 343-355