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Godskesen, Berit; Zambrano, K.; Albrechtsen, Hans-Jørgen

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Life-cycle assessment of 3 alternatives for storm water management in Nordhavn

B. Godskesen^{***}, K. Zambrano^{*}, H.-J. Albrechtsen^{**}

Abstract

The water utility and authorities are in the process of identifying the optimal alternative for storm water management in the planned new developing area of Copenhagen called Nordhavn. This study used life-cycle assessment to quantify the environmental impact of one centralized and two local alternatives for storm water management in Nordhavn: A0 Combined sewers, A1 Bonnerup Separator and A2 Double Porous Filter. To evaluate the environmental impact, life-cycle assessment (LCA) is an eminent tool when considering a product (Wenzel *et al.*, 1997) and this tool has currently also been applied to services within the water sector such as water supply and wastewater treatment (Lundie *et al.*, 2004; Godskesen *et al.*, 2011). The traditional practice in Copenhagen is to transport storm water via combined sewers to the wastewater treatment plant where it is treated before being discharged into Oeresund. As an alternative to this centralized system local storm water facilities have emerged and during the past years several local alternatives have been tested in Copenhagen.

In A1 and A2 storm water is transported by gravity to a location where the treatment facility is situated and discharged to the Harbor in Nordhavn. In all 3 alternatives the discharged storm water complies with the regulation for nitrogen and phosphorous content of discharged wastewater. However, a preference for the local alternatives was seen for the impact categories Global Warming and Acidification and the opposite for Nutrient enrichment.

This presentation will focus on the application of life-cycle assessment as a decision support tool in the water sector and the background & results of the case study of storm water management in Nordhavn.

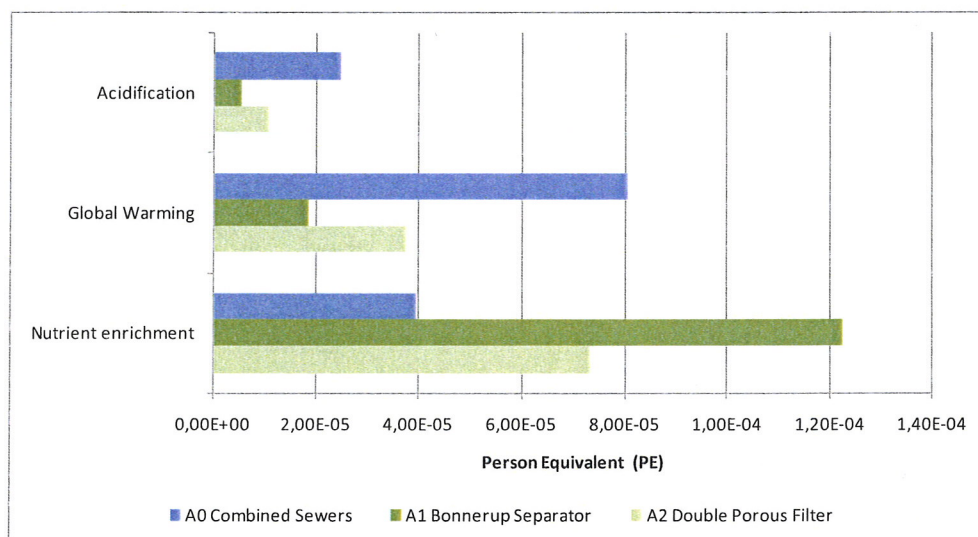


Figure 1. Results from the life-cycle assessment presenting the environmental impact of three alternatives for storm water management in Nordhavn; A0 is transport via combined sewers to a centralized treatment plant, A1 and A2 are local treatments.

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* (bego@ke.dk; kiza@ke.dk) Københavns Energi A/S, Ørestads Boulevard 35, 2300 København S, Dk

** (hana@env.dtu.dk; berg@env.dtu.dk) DTU Env, Miljøvej, Building 113, 2800 Lyngby Dk

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ABSTRACTS