Background & objectives
A central issue for life cycle impact assessment of landfill emissions is the very long time horizon over which their release takes place. Very small concentrations of pollutants (especially heavy metals) are emitted from the landfill during thousands of years. In LCIA impacts are modelled using steady-state conditions, applying integration over a defined time horizon. Integrating the impacts of long-term emissions over 500 years, and thus neglecting impacts occurring later, leads to a strong underestimation of their impacts. On the other hand, a full consideration via integration over large or even infinite time horizons would lead to a strong overestimation, as the (perhaps small) impacts occurring over a long period of time would be fully attributed to the product as if they were occurring right now (as one large impact). These two extremes represent a dilemma for which a meaningful solution is needed in LCIA.

Main activities
• Emissions: Investigate existing information and research on emission profiles from landfills
• Develop a methodology for site- and technology-specific assessment of the toxic impacts from long-term landfill emissions and incorporate to site-generic IA performed in e.g. USEtox
• Spatial variation: Analyse the influence that local variations in central characteristics of the receiving environment will have on the effects of emissions from landfills
• Uncertainties should systematically be considered both quantitatively and qualitatively.

Expected outcome
The work will involve 1) analysis of current approaches and alternatives, 2) testing of existing models and development and adaptation of these to accommodate the developed methodologies and 3) assessment of main sensitivities and uncertainties.

New value in relation to existing knowledge
A more accurate representation of impacts from long-term emissions is foreseen and their proper inclusion and comparison in the analysis will be allowed. Moreover, the LCA results would be interpreted in a more realistic way reducing the uncertainty from landfill impacts.

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