Evaluation of Best available technologies in waste handling using LCA considerations

Requirements for BAT in waste handling:
Maximum performance - minimum environmental burden

… less emissions, waste and waste water
… less energy and raw material input
… more material recovery and recycling

→LCA considerations required for the evaluation of BAT

46th LCA Discussion Forum

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ETH Zürich

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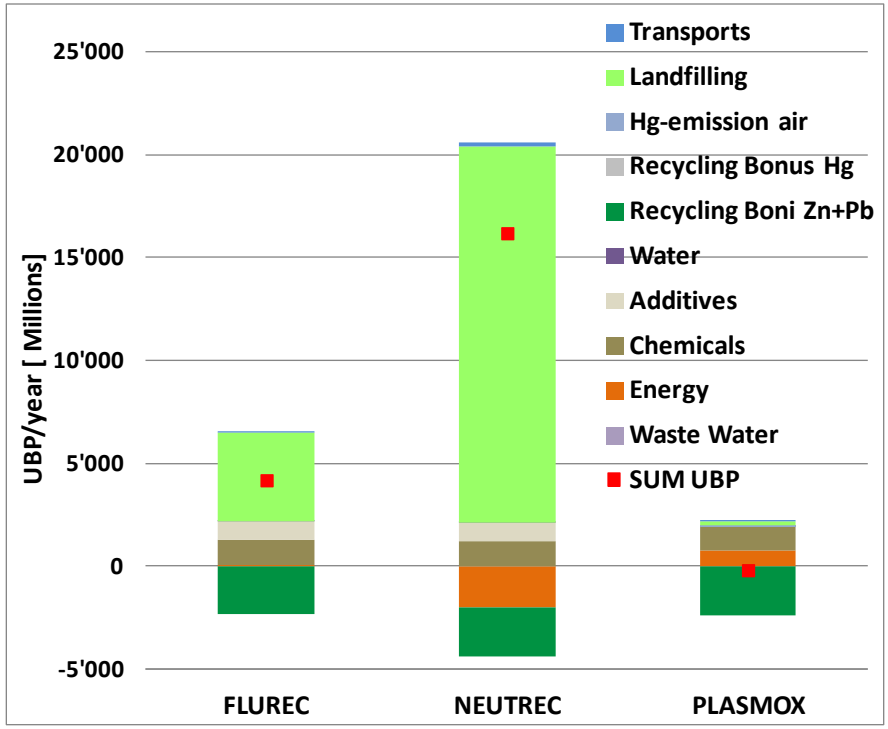
Ongoing projects

Kt. Zürich (AWEL):
→ incinerator filter ashes: Hg, Zn …
→ incinerator slag: Fe, Cu, Al …
→ excavated soils: hydrocarbons



Graph: Treatment of incinerator filter ashes, comparison of several techniques by a simplified LCA .
200'000 t waste/y → 2'800 t ashes/y

Result: Requirements that have to be fulfilled for the BAT:
(treatment of incinerator filter ashes in Switzerland)

→separation rate of Hg: > 99% of input into flue gas cleaning AND
re-use OR deposition in underground depot
→ separation rate of Zn (Pb): > 65% (> 30%) of mass in non-treated ashes AND re-use

Discussion & Conclusion

Challenge: Correct quantification of the environmental impact from leached metals in landfilled waste

Dilemma: which time frame should be considered in the LCA? „cutoff“

100 years → leaching of only a part of the metals is considered
→ opposition to sustainability criteria: pollution emerging later is considered insignificant
unlimited → leaching of 100% of the metals is considered
→ maximum mass flow of pollutants: landfilling is insignificant

Time frame is set to 60‘000 years (natural erosion, next ice age)

Aspects on leaching are based on work by S. Hellweg, A. Johnson and G. Doka.