Environmental impacts of food waste: Learnings and challenges from a case study on UK - DTU Orbit (03/11/2019)

Environmental impacts of food waste: Learnings and challenges from a case study on UK

Food waste, particularly when avoidable, incurs loss of resources and considerable environmental impacts due to the multiple processes involved in the life cycle. This study applies a bottom-up life cycle assessment method to quantify the environmental impacts of the avoidable food waste generated by four sectors of the food supply chain in United Kingdom, namely processing, wholesale and retail, food service, and households. The impacts were quantified for ten environmental impact categories, from Global Warming to Water Depletion, including indirect land use change impacts due to demand for land. The Global Warming impact of the avoidable food waste was quantified between 2000 and 3600 kg CO2-eq. t⁻¹. The range reflected the different compositions of the waste in each sector. Prominent contributors to the impact, across all the environmental categories assessed, were land use changes and food production. Food preparation, for households and food service sectors, also provided an important contribution to the Global Warming impacts, while waste management partly mitigated the overall impacts by incurring significant savings when landfilling was replaced with anaerobic digestion and incineration. To further improve these results, it is recommended to focus future efforts on providing improved data regarding the breakdown of specific food products within the mixed waste, indirect land use change effects, and the share of food waste undergoing cooking. Learning from this and previous studies, we highlight the challenges related to modelling and methodological choices. Particularly, food production datasets should be chosen and used carefully, to avoid double counting and overestimation of the final impacts.

General information
Publication status: Published
Organisations: Department of Environmental Engineering, Residual Resource Engineering, European Commission Joint Research Centre Institute
Corresponding author: Tonini, D.
Contributors: Tonini, D., Albizzati, P. F., Astrup, T. F.
Pages: 744-766
Publication date: 2018
Peer-reviewed: Yes

Publication information
Journal: Waste Management
Volume: 76
ISSN (Print): 0956-053X
Ratings:
BFI (2018): BFI-level 2
Scopus rating (2018): CiteScore 6.15 SJR 1.523 SNIP 2.193
Web of Science (2018): Impact factor 5.431
Web of Science (2018): Indexed yes
Original language: English
Keywords: Avoidable food waste, Land use changes, iLUC, Carbon footprint, Waste management, Uncertainty
Electronic versions:
1_s2.0_S0956053X18301740_main.pdf
DOIs: 10.1016/j.wasman.2018.03.032
Research output: Contribution to journal › Journal article – Annual report year: 2018 › Research › peer-review