Integrating impacts of microplastics in Life Cycle Assessment modelling: the work of the MarILCA group

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Abstract

Despite the potential harm that marine plastic litter causes on the environment, up until now Life Cycle Assessment studies have essentially ignored the leakage of plastic fractions to the biosphere in their inventory modelling, as well as their impact assessment. In this communication, the MarILCA (Marine Impacts in LCA) working group and its recent deliverables will be presented in order to inform the community of the current status of knowledge and ongoing development regarding the integration of marine and plastic litter in LCA. The first two deliverables of the MarILCA working group were published last year: the first one (Woods et al., 2021) presents the framework that was proposed in order to map the different impact pathways associated with plastic emissions. The second one (Lavoie et al., 2021), proposes effect factors for nano and microplastics particles in aquatic environments (marine and freshwater), due to physical effects on biota. These were used in a third deliverable (Corella-Puertas, 2021) which proposed for the first time microplastic (expanded polystyrene - EPS and Tire and roadwear particle - TRWP) Characterisation Factors and tested them in a case study. These factors were now updated and expanded to cover the nine main polymers, including different size and shapes. The integration of the potential impacts on aquatic and marine ecosystems of microplastic emissions in the environment have shown to be mostly insignificant compared to other impact categories, mostly climate change, with the exception of an EPS food container.

Keywords: LCA, Life cycle Assessment, microplastic

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