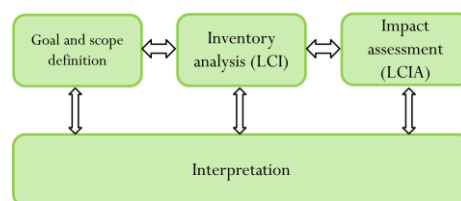


Safety, LCA and certification practices toward green chemicals and biodegradable new products. Experiences from the (BBI-JU) Mandala project

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Food packaging facilitates storage, handling, transport and preservation of food and it is essential for preventing or at least decreasing food waste. Besides these beneficial properties, food packaging causes rising concern for the environment due to its high production volume, often short usage time, and problems related to waste management and littering. Reduction, reuse, and recycling, but also redesign support the aims of the Circular Economy to decrease the environmental impact of food packaging.

The LCA results on new developed bio-packaging is provided and discussed according to the ISO 14040-44:2006 standard (and subsequent amendments and additions during 2017, 2020) following the defined steps: (i) goal and scope definition, (ii) inventory analysis (LCI), (iii) impact assessment (LCIA) and (iv) results interpretation.



The development of new compostable and biodegradable packaging products made from natural and synthetic polymeric materials, in controlled composting facilities can be an important method of reducing garbage. Defined pre-requisite for official regulations and the decision as to which materials may be composted is investigations on their biodegradability, physical breakdown and the quality of the compost produced in terms of agronomic parameters and toxicity towards plants (EN 13432 official Standard).

The Health & Safety assessment on new products, entire manufacturing cycles and application pilot scale process need to be performed both for workers and workplaces to assure the compliance with the official Limits of the specific Regulations (for example, ACGIH 2021), to provide an overall identification and quantification of hazards and exposure of developed products and processes and good practice procedures to eliminate or minimise the risks. The safety of MANDALA products is investigated taking into account its relation to the current standards and regulations such as REACH for the classification and identification of hazardous substances that could determine the hazard in the new products, at what concentration level, to check their classification and assess if they meet the criteria of SVHC.

The new packaging products developed during MANDALA EU project were tested for safety and for the assessment of the biodegradability and compostability performances and were studied for LCA: the obtained results provided the compliance with the current EN 13432 Regulation and the quantification of the main environmental impacts and sustainability of the materials and the proposed technologies. The H&S results demonstrate that the process for the production of the packaging complies with the ACGIH limits, and the process is safe for workers.

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