

PEF - A Circular Bio-based plastic with improved properties.

Part 2 / Life Cycle Assessment

Life Cycle Assessment (LCA) is fundamental to understanding the potential sustainability benefits of Avantium's YXY® Technology and various PEF applications, as well as to identifying opportunities for improvement. LCA is the most recognised method to quantitatively assess potential environmental impacts of products, services, or processes.

In this respect, The Chemical technology company Avantium partnered with nova-Institut GmbH under the framework of the EU BBI PEFerence project, to perform a full cradle-to-grave Life Cycle Assessment (LCA) for the YXY® Technology, assessing the potential environmental impacts of PEF packaging solutions in comparison to conventional PET packaging.

The study assessed PEF- and PET-based monolayer and multilayer containers and covered all relevant life cycle stages from cradle-to-grave: from the biomass cultivation (wheat for fructose and sugarcane for bio-MEG feedstocks supply) and crude oil extraction (reference system) to the production of PEF and PET bottles including their end-of-life options (recycling and incineration). The analysis evaluated 16 different impact categories, covering a complete set of indicators addressing impacts on ecosystems, human health, and depletion of resources.

The LCA was performed according to the ISO 14040/44 standard methodology. A critical peer review of the study, including experts of incumbent technologies, was conducted and verified that the LCA met the requirements for methodology, data, interpretation, and reporting.