UNIVERSIDADE D COIMBRA

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ALUNOS ♦ EMPRESAS

An approach to enhance the sustainability of novel biopolymers

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Received degree in Environmental Eng. (2017) at the Federal Univ. of Ceará and M.Sc. Energy for Sustainability (2020) at UC. Main research interests: Ex-ante LCA, Sustainability LCA, and MCDA, applied to bioproducts, food, and packaging.

Supervisors: Prof. Fausto Freire (DEM-UC), Dr. Carla Rodrigues (ADAI)

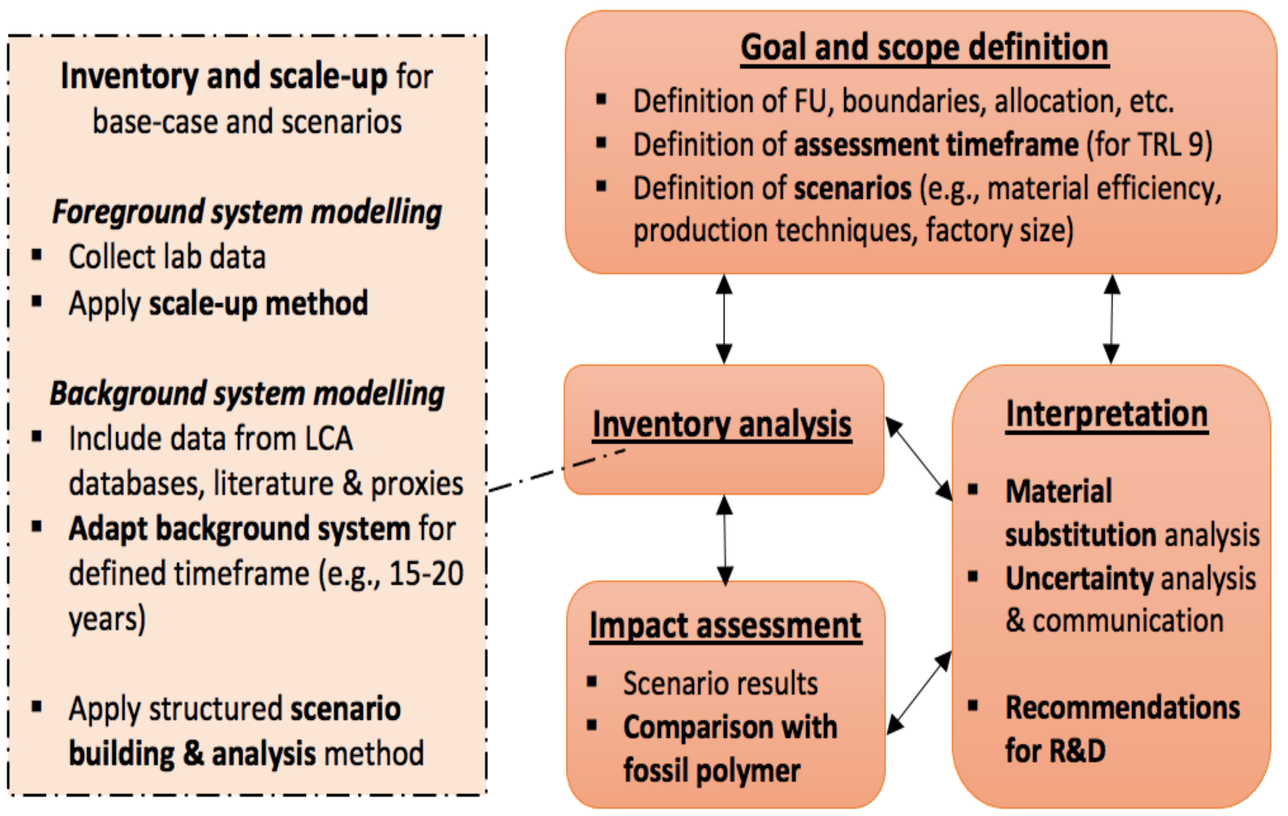
Collaborations: Embrapa Agroindústria Tropical; inesc 30 anos coimbra; Joint Research Centre JRC; Universiteit Leiden

Motivation

Ex-ante life cycle assessment (LCA) can support the development of sustainable biopolymers from R&D stages and explore environmental consequences of replacing fossil-based polymers.

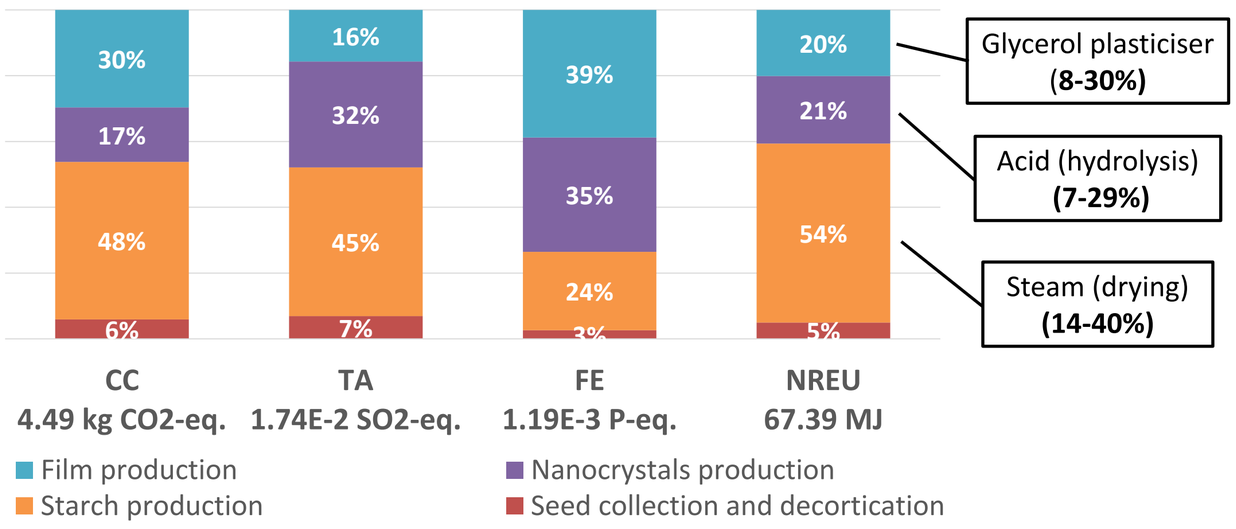
Goal

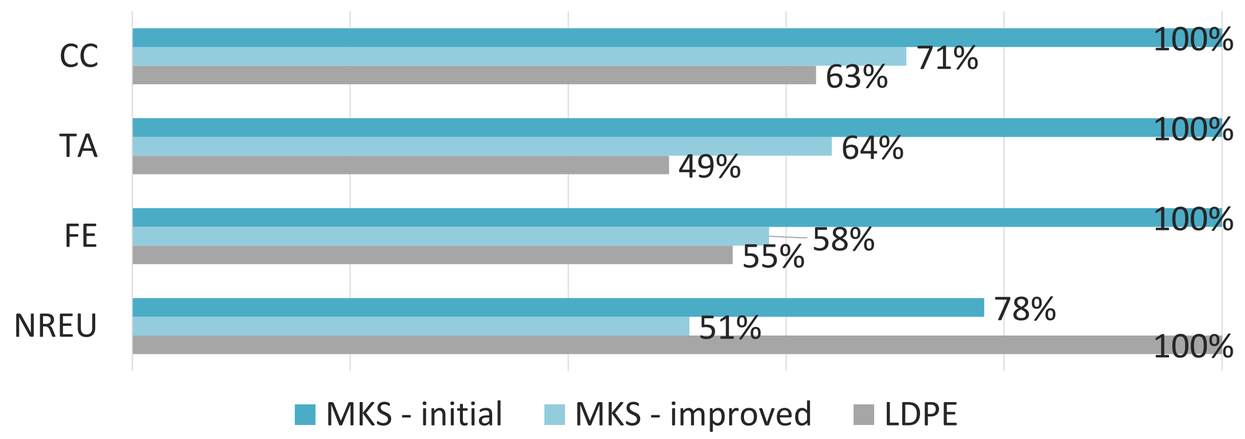
To develop an eco-design approach for novel biopolymers (TRL 3-5, lab-scale) for food packaging, combining *ex-ante LCA* and *multi-criteria decision analysis (MCDA).*



Preliminary results

Application to mango kernel starch film (TRL 3) compared to its fossil counterpart, LDPE film (TRL 9)





Learning effects and *functionality* still need to be addressed to improve the comparability of novel biopolymers & mature fossil-based polymers.

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