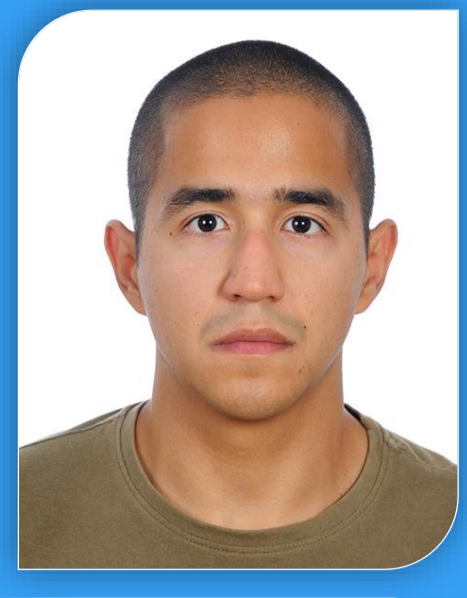


Ecodesign of plastic products: a novel approach and applications



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MIT Portugal 2023 Annual Conference

Motivation

- Plastic industry plays an essential role in improving the quality of life for millions of people worldwide;
- The extensive use of plastic products is increasing concerns about their environmental impacts;
- In 2021, plastic production reached 50.3 million tonnes in the European Union.

Research goals

Develop an ecodesign approach using applications from plastics industries to improve their life-cycle performance.

- Identify environmental and cost hotspots of plastic products using LCA & LCC;
- Explore ecodesign strategies and evaluate their impacts;
- Integrate MCDA with LCA and LCC to support the evaluation of ecodesign strategies.

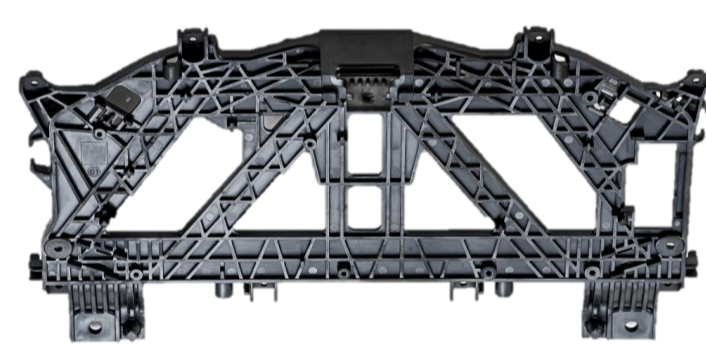
Ecodesign approach

Applications

Nutraceutical packaging



Automobile components



Life Cycle Assessment (LCA) & Costing (LCC)

Goal and Scope Definition

Life Cycle Inventory

Impact Assessment

Interpretation

Multi-Criteria Decision Analysis (MCDA)



Sets of environmental categories



Costs

Ecodesign strategies

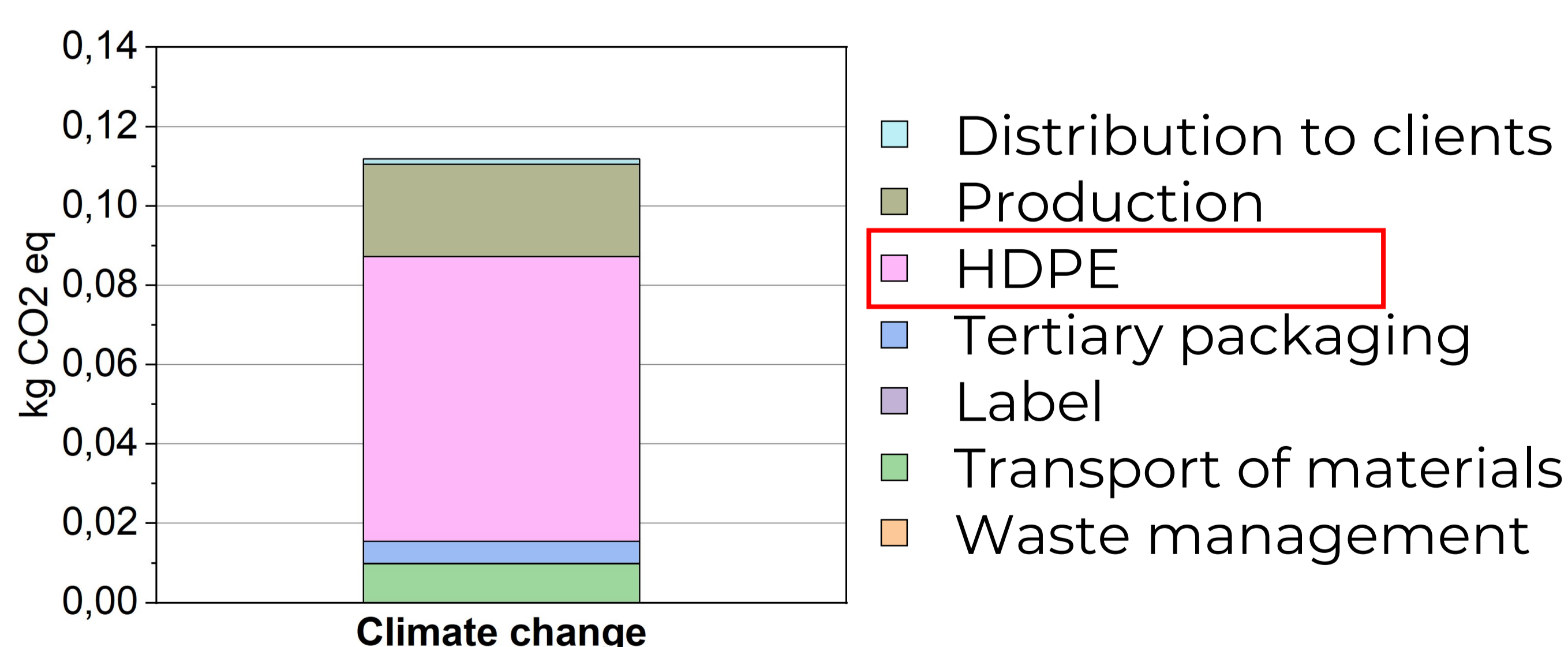
Alternative materials

Light weighting

Surface treatments

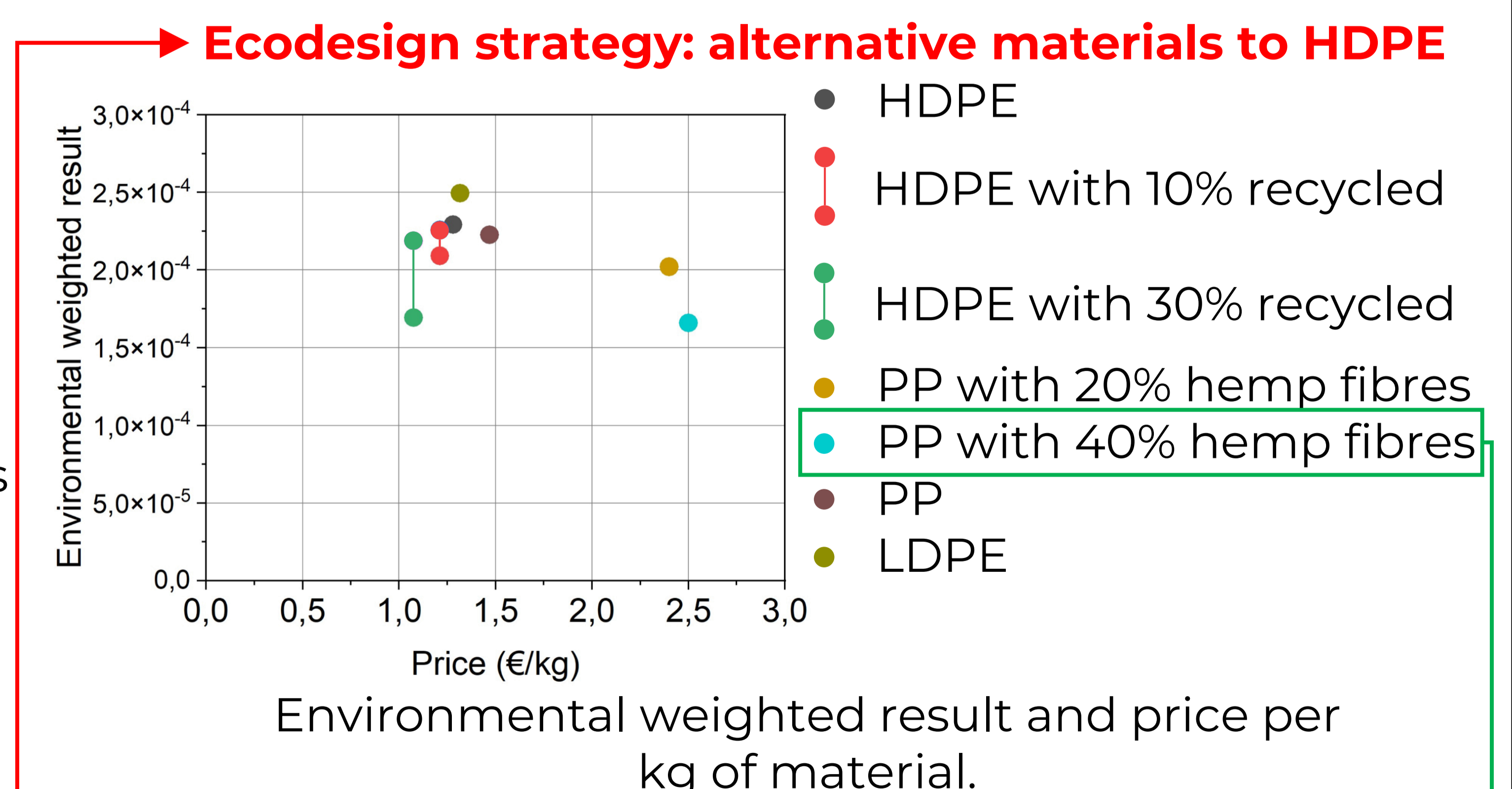
Uncertainty & Scenario analysis

Preliminary results (for nutraceutical packaging)



Cradle to gate impacts of one nutraceutical packaging of 350 ml.

HDPE presents the largest environmental impacts.



Best alternative from an environmental perspective, but it has the highest price.

Funded by:



MIT Portugal



under the Doctoral Grant PRT/BD/154263/2022 | MPP research area