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LGP2 (A. BOYER)

BIO-4-INKS: Life Cycle Assessment (LCA) of 100% bio-based inks for newspaper offset printing

Analyse de cycle de vie d'encres 100% bio-sourcées pour l'impression offset de la presse

Biochip / FunPrint

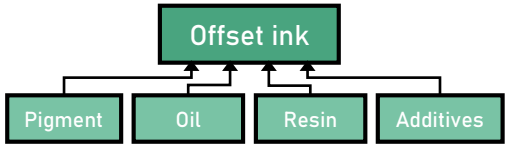
Context / Objectives

Context

- Limited recent available LCA data to guide industrials in their eco-design approach
- Environmental impacts of newly-used bio-based vehicles are little studied
- Bio-based pigments are being studied as substitutes for conventional petroleum-based colorants

Objectives

- LCA modeling of both conventional and 100% bio-based inks formulations in the European context



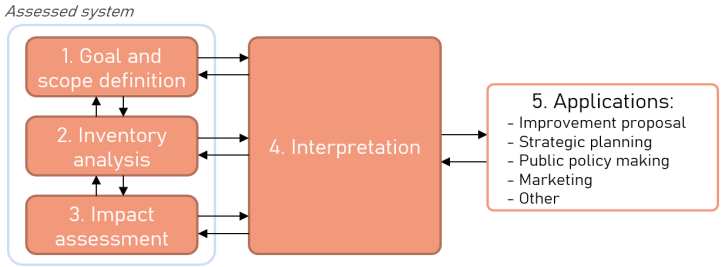
- Calculation of the environmental weight of pigment in current industrial offset inks
- Impact transfer assessment through comparative LCA
- Identification of possible future improvements

Funded by: MINISTÈRE DE LA CULTURE (Liberté Égalité Fraternité) · CITEO

In collaboration with Écograf, SunChemical, Grakom

Methods

System definition



LCA framework (ISO 14 044)

Data collection

Primary data

- Industrial partners

Secondary data

- Ecoinvent
- Literature review

Conjunction with lab work and choice of FU

- Bio-based pigments: technical relevance of assessed solutions are validated in lab environment
- Functional Unit (FU) is linked with the optical performances (contrast, color, i.a.) of the formulated inks.

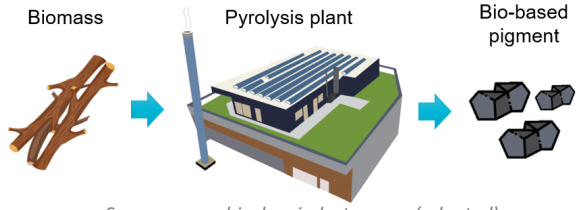
Need for multi criteria approach

LCA method: Environmental Footprint V3.1

Preliminary results

Modeling of bio-based black pigment

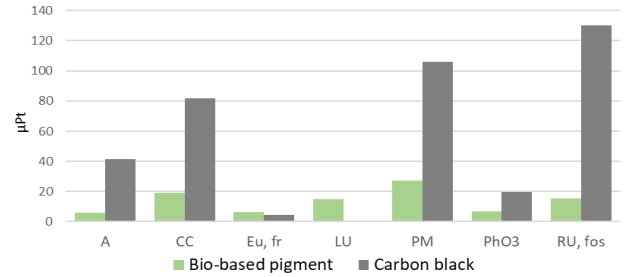
- Based on literature study and industrial data



Source: www.biochar-industry.com (adapted)

Comparative LCA of black pigments

Comparison 1kg of bio-based pigment vs 1kg of carbon black



A: Acidification, CC: Climate change, Eu, fr: Eutrophic., freshwater, LU: Land use, PM: Particulate matter, PhO3: Photochem. O_3 formation, RU, fos: Resource use, fossils

→ *Bio-based pigment shows a positive influence on 5 out of 7 of the main impact categories. Optical performances are to be validated in lab.*

- The overall ink formulation (pigment, vehicle and additives percentages) shall be considered to assess the total impact transfer.