May 9th, 2023
Bioeconomy For Change
Online workshop

ALIGNED

CONSTRUCTION - PULP AND PAPER - WOODWORKING - TEXTILE - BIO-CHEMICALS.

Aligning Life Cycle Assessment methods and bio-based sectors for improved environmental performance

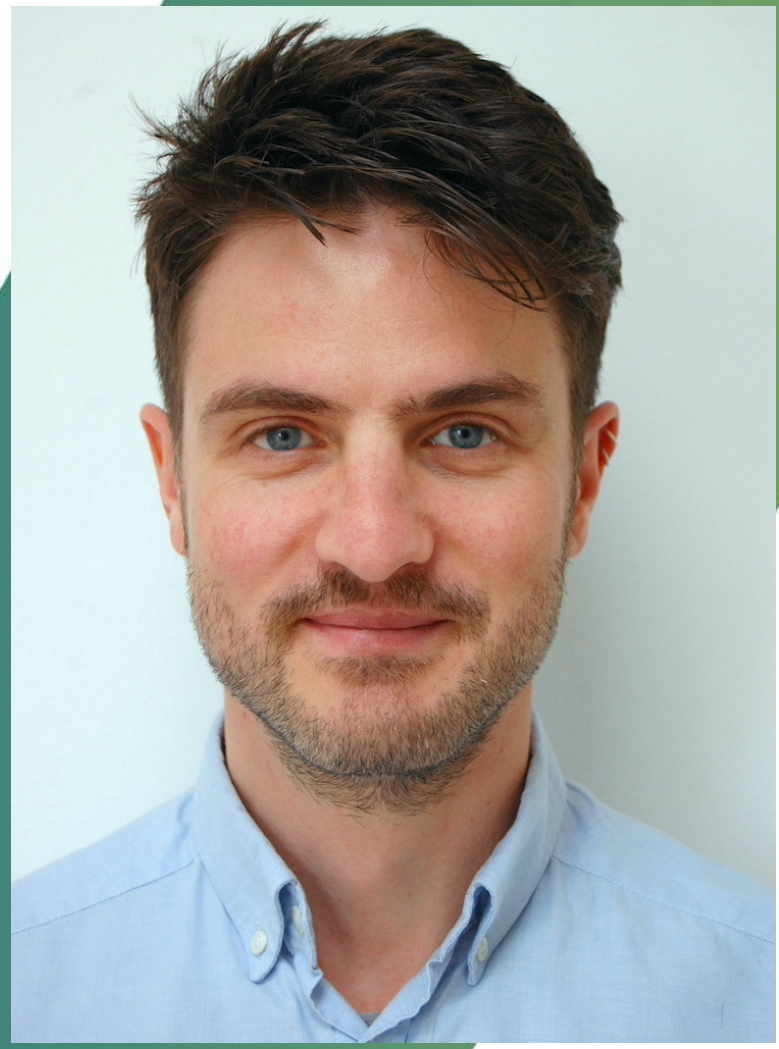
Funded by the European Union

Horizon Europe grant agreement N° 101059430. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

Massimo Pizzol

ALIGNED coordinator

- 10 more years in LCA
- Aalborg University (DK)
- Prospective assessment of technology
- Uncertainty analysis
- Green and blue bioeconomy



massimo@plan.aau.dk
@m_outreach

https://vbn.aau.dk/en/persons/117459/projects/

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About

- 3 years
- 3.5 M euro (Horizon Europe)
- 13 Scientific & industrial partners
- 5 sectors

CONSTRUCTION

WOODWORKING

PULP AND PAPER

TEXTILE

BIO-CHEMICALS

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Objectives

1. Improve, harmonize, and align LCA methodology for the assessment of bio-based industries (environmental and socioeconomic)

2. Demonstrate on five specific technology development cases in industries within the sectors, improve their environmental performance

3. Inform, involve, and empower all relevant stakeholders, enabling an efficient methodological uptake and practice improvement

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Key improvement areas

Methods tailored to specific biobased issues:

- **Land and biomass competition**
- **Carbon accounting (dynamic, inventory and LCIA)**
- **Impacts on land use and biodiversity**
- **Socio-economic impacts**
- **Handling uncertainty**

Apply to improve the performance in five exemplary industrial processes, derive learnings for the sectors

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WP1:
Shared modelling framework and learnings

(AAU)

WP2: Bio-based construction (INSAT)
- Case study: Insulation Industrial partner: Kingspan (Netherlands)

WP3: Woodworking (ANTW)
- Case study: Facades and fences: Kingspan (Netherlands)

WP4: Bio-based textiles (BTG)
- Case study: work clothing. Industrial p. Centexbel and Utexbel (Belgium)

WP5: Pulp and paper (AAU)
- Case study: lignin products. Industrial partner: BLOOM (Switzerland)

WP6: Bio-based chemicals (NTNU)
- Case study: Oleochemicals Industrial partner: OLEON (France)

WP9: Microalgae (A4F)
- Case study: Microalgae cultivation tech. Industrial partner: A4F (Portugal)

WP7: stakeholder involvement, dissemination, communication (SIE)

WP8: Management (AAU, BTG)

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WP1 – Ambition

Framework:

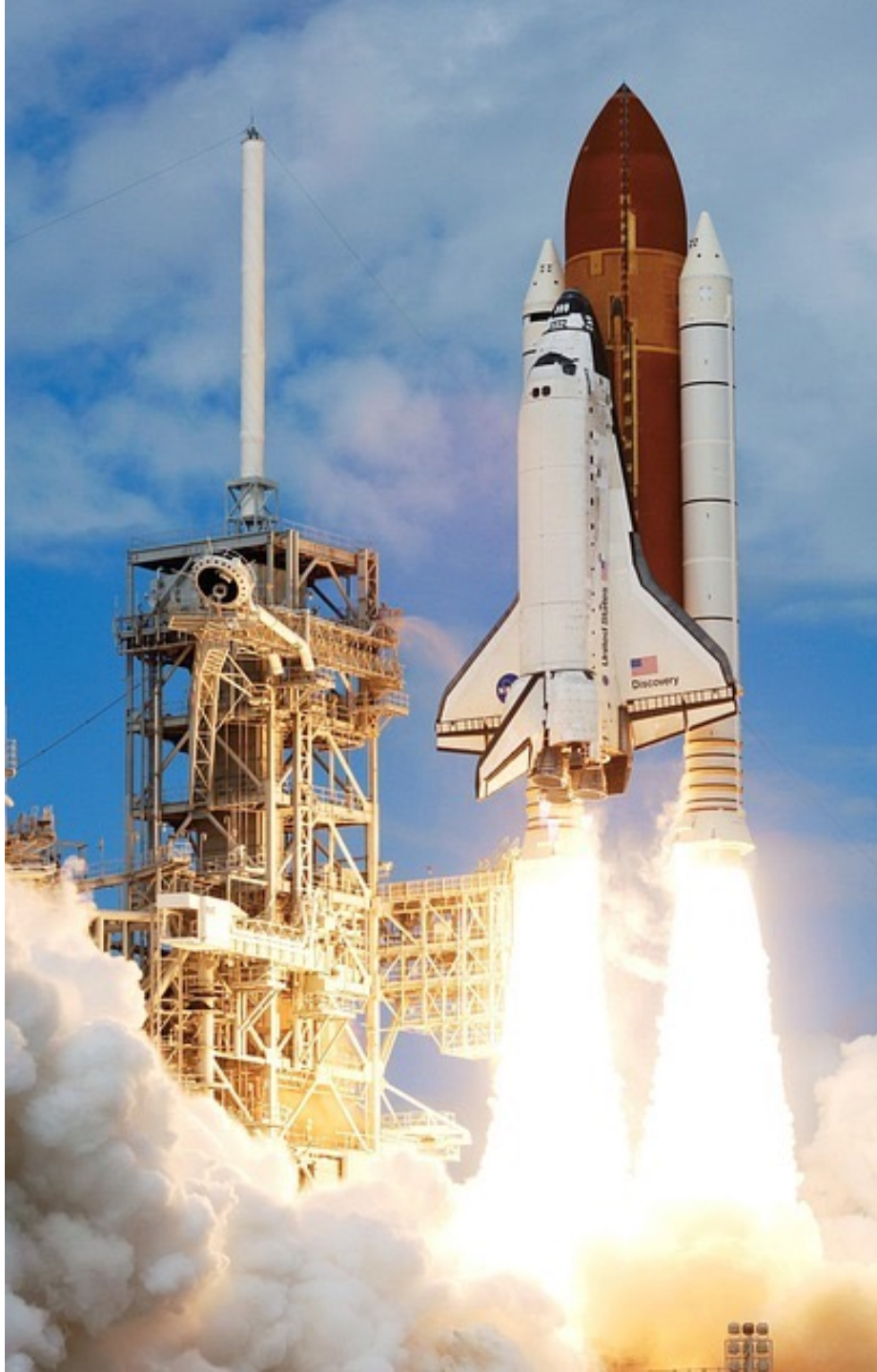
- Scientifically sound, evidence-based
- Ensures consistency across models

Approaches:

- Model reality as close as possible
- Avoid normative choices

Tools:

- High applicability (simple, work across sectors, open)
- Tested on the case studies, continuous improvement



WP1 Shared modelling framework (and learnings) for…

- **Background life cycle inventory of bio-based sectors :** Prospective database for assessing emerging biobased technologies (T1.1)
- **Foreground life cycle inventory of bio-based sectors:** Models for dynamic forest carbon inventory and assessment of competition for land (T1.2)
- **Life Cycle Impact Assessment (LCIA):** Dynamic characterizations factors for climate, selection of biodiversity impact indicators (T1.3)
- **Interpreting uncertainty**: practical guideline (T1.4)
- **Socio-economic assessment**: techno-economic assessment tool (T1.5)
- **Learning from LCA in bio-based sectors:** roadmap and policy advice (T1.6)

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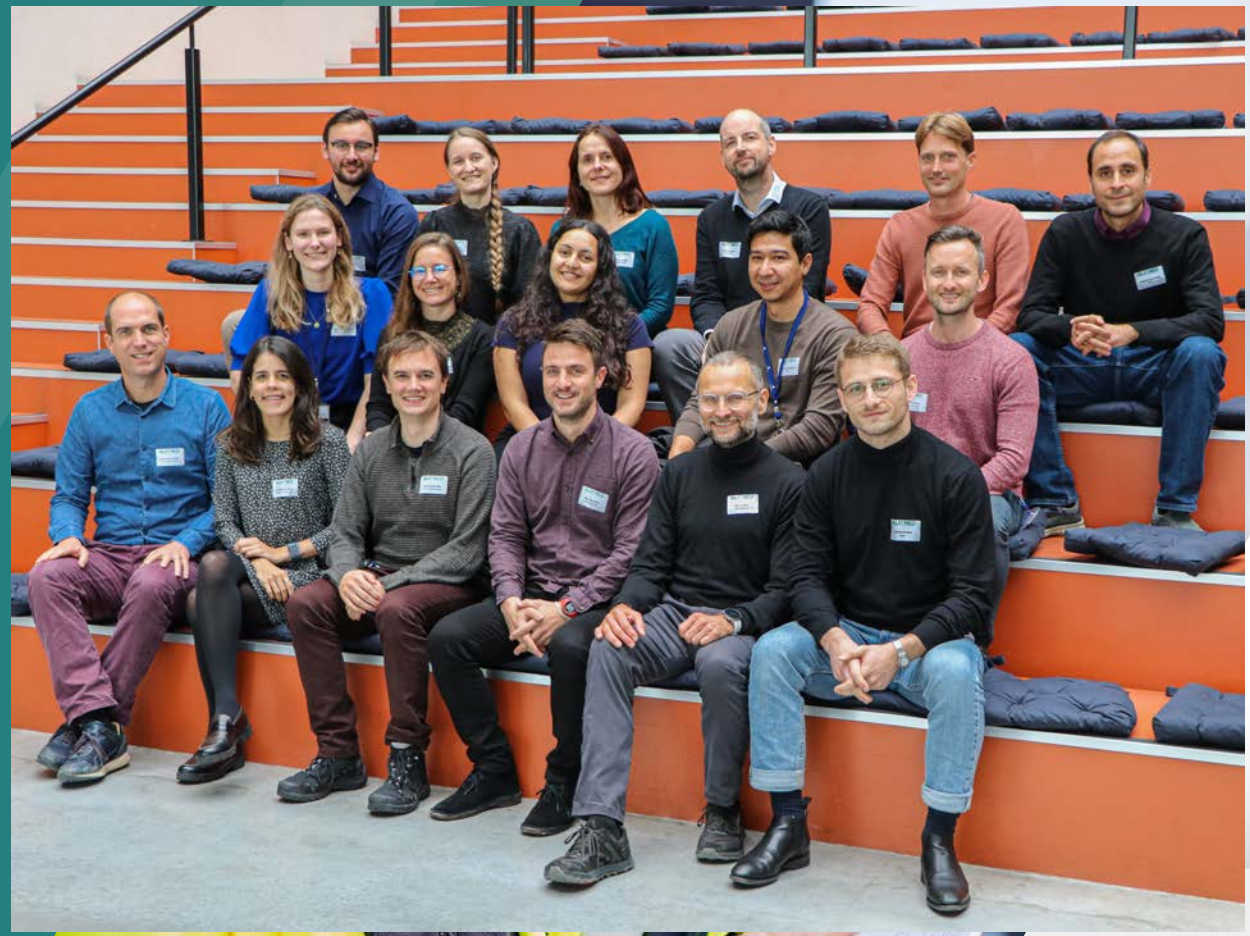
WP2-6 & 9 - cases

Sector	Partners involved (WPL + industrial partners)	Subfield and location	Short summary of the case study
Construction	INSAT, KING (WP2)	Insulation, Netherlands	• Bio-based phenolic foams used as insulation materials. Phenol replaced by lignin and phenol fully replaced by bio-based oil • New mechanical recycling process
Woodworking	ANTW, FOR (WP3)	Chemical treatment, Netherlands	• Use alternative wood-working feedstocks such as untreated, treated, and painted timber for façade applications. • New types of fencing applications
Bio-based textiles	BTG, UTEX, CENT (WP4)	Work clothing, Belgium	• Recycling of work clothing containing both polyester and cotton fibres • Valorisation of waste cotton fibres from shredding
Pulp and paper	AAU, BLOOM (WP5)	Lignin products, Switzerland	• Biorefinery focusing on lignin valorization using aldehyde assisted fractionation to produce multiple products such as lignin polymers, oligomers, cellulose.
Bio-based chemicals	NTNU, OLEON (WP6) A4F (WP9)	Oleochemicals, France Microalgae, Portugal	• Impact of different vegetable oil use in the production of consumer products. • Impact of different improvements for energy and water savings in the production of microalgal-based biochemicals



THANK YOU

AND SEE YOU SOON

GET CONNECTED

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