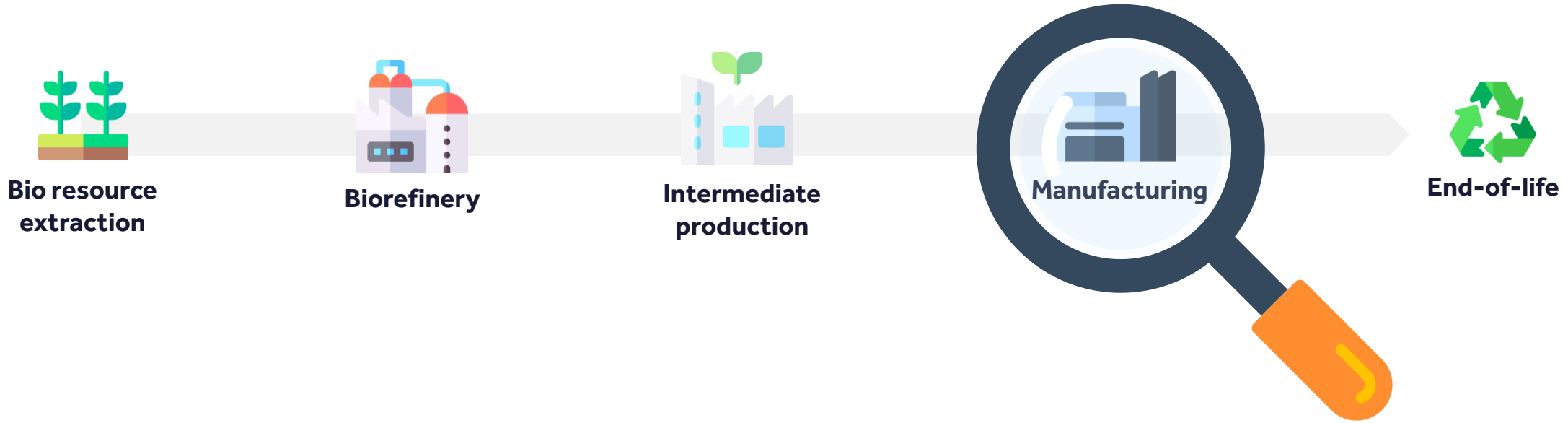
Work package 7
PHA Carbon footprint

Micha Klaarenbeek & Amarens de Wolff

LCA

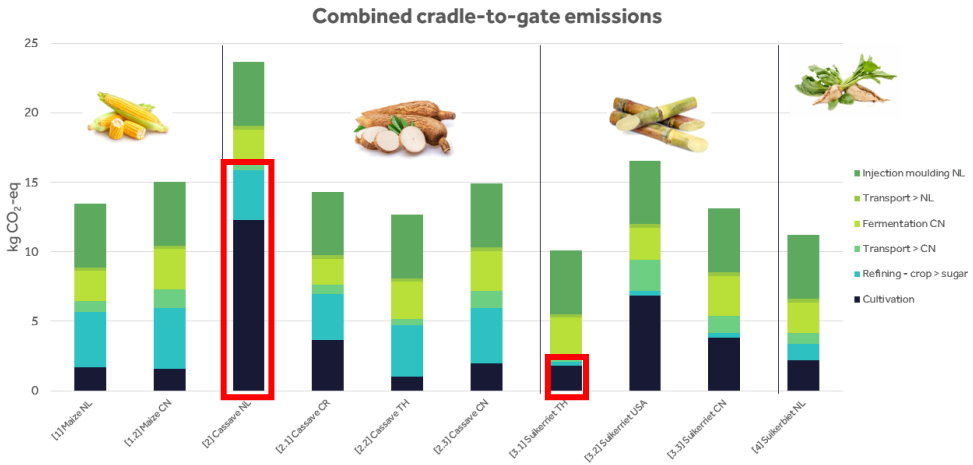
- **Goal:** CO_2 footprint of 1 kg PHA product



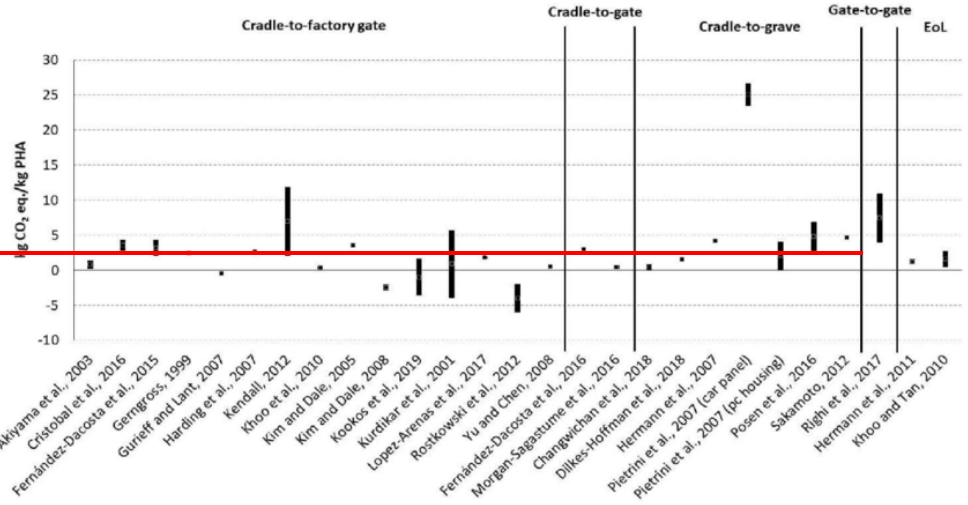
LCA

Challenges:

- Large variance in CO2 footprint for virgin PHA



3.5 kg CO2 average



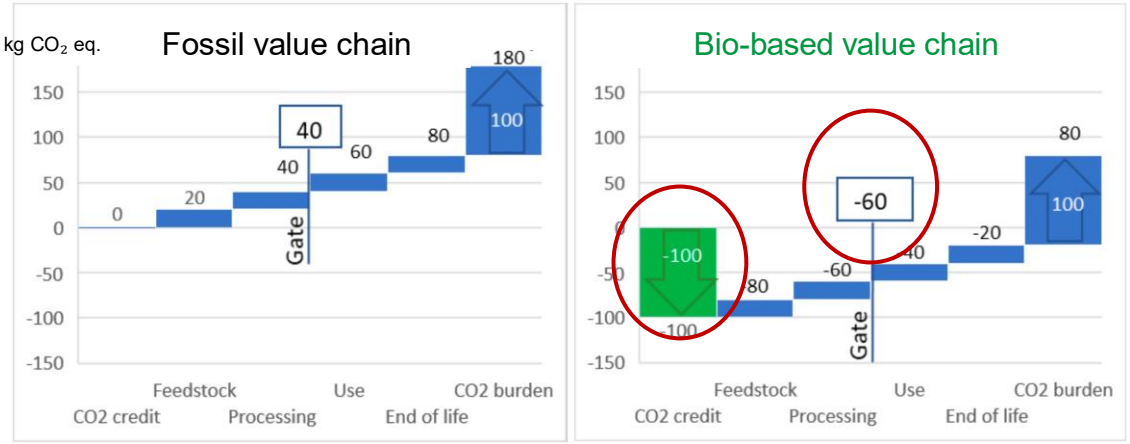
LCA

Challenges:

- How to include CO2 uptake

Suggested approach by biobased industry consortium (BIC)

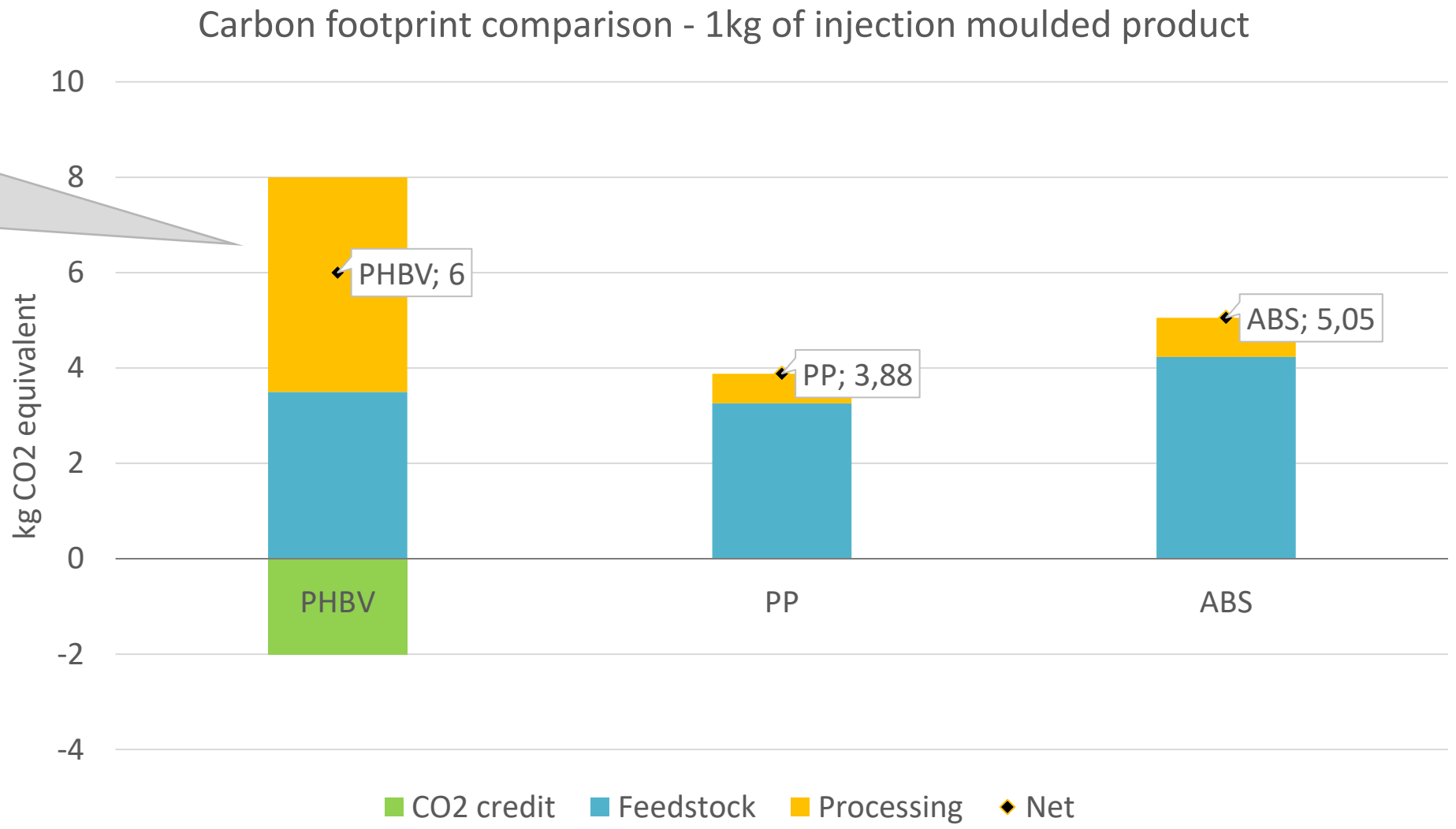
-1/+1-approach for biogenic carbon



Source: Nova-institute, 2024

Cradle-to-gate comparison

Includes
- Pre-drying
- Mould tempering
- Injection moulding



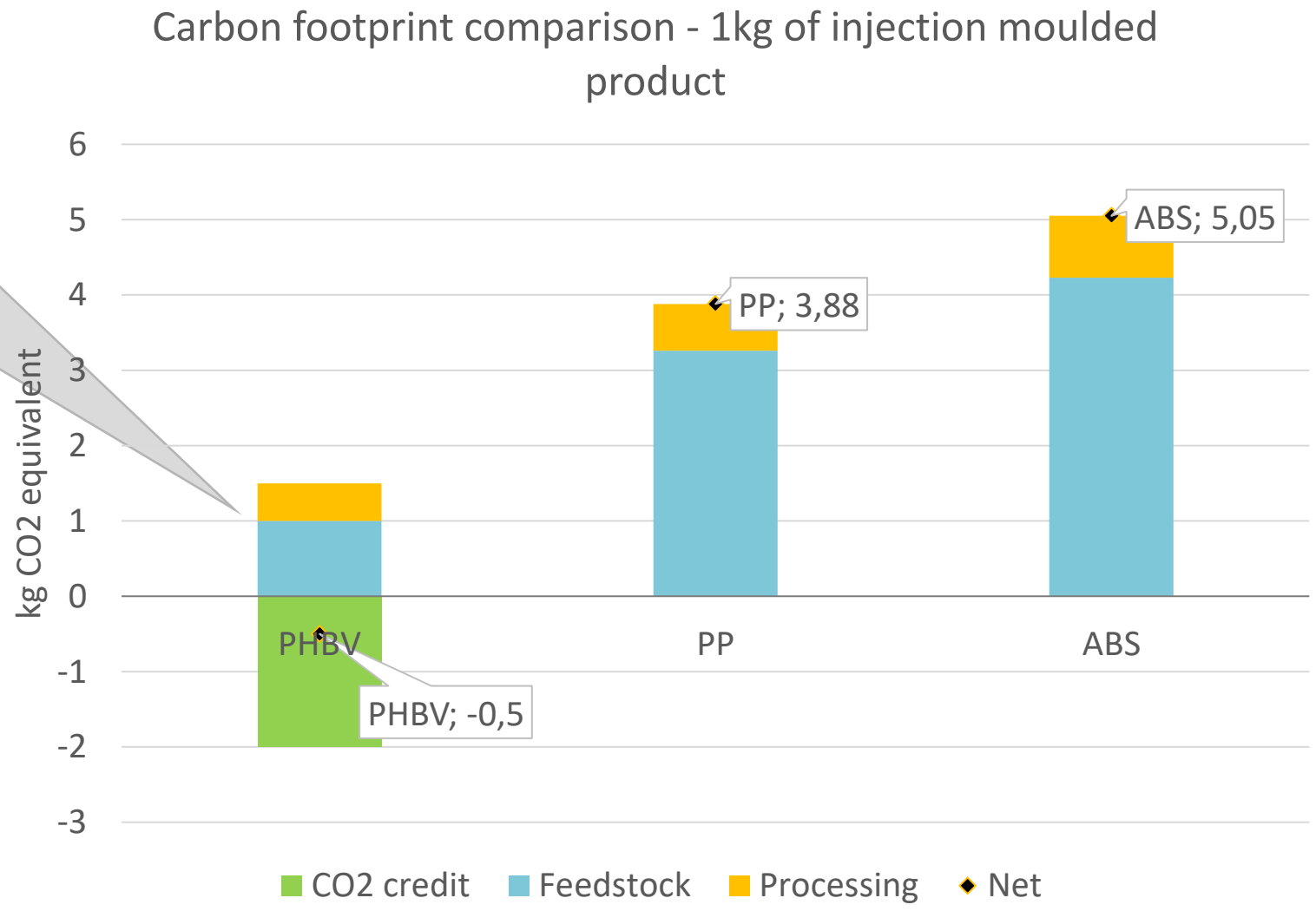
Optimized

Processing:
- +/- 80% solar energy use for processing

Feedstock
- Lower carbon footprint PHA (1kg CO2 per kg)

Bio-compounds can further lower the footprint!

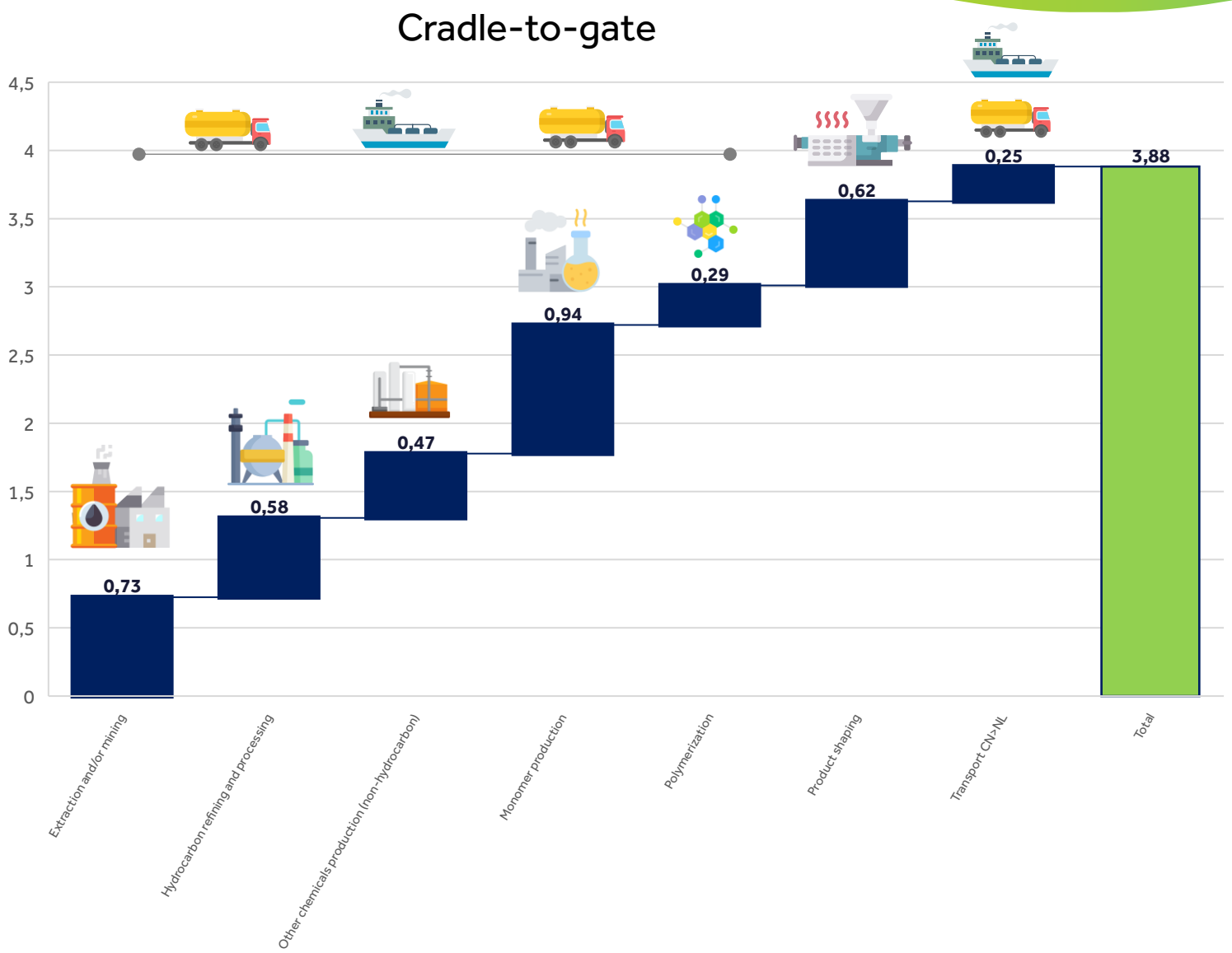
Footprint biomaterials
- **Dry pea-fibre:** +/- 1,5 kg per kg dry pea fibre (excl carbon uptake)
- **Hemp fibre:** +/- 0,57 kg per kg hemp fibre (excl carbon uptake)

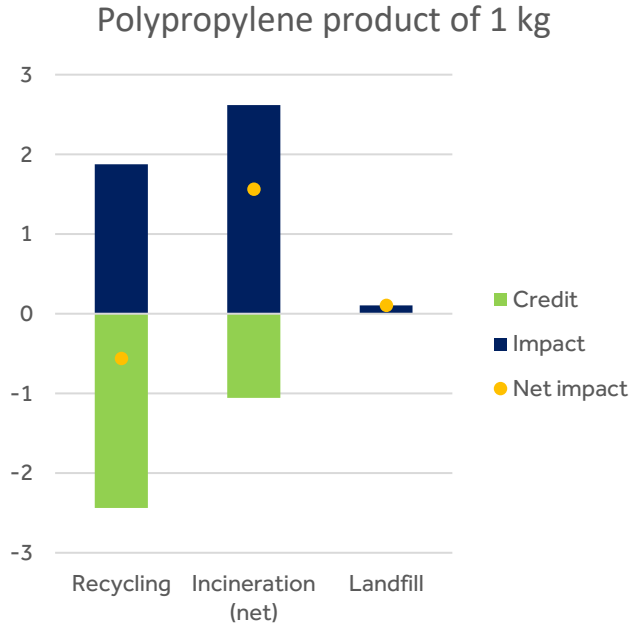


Data collection

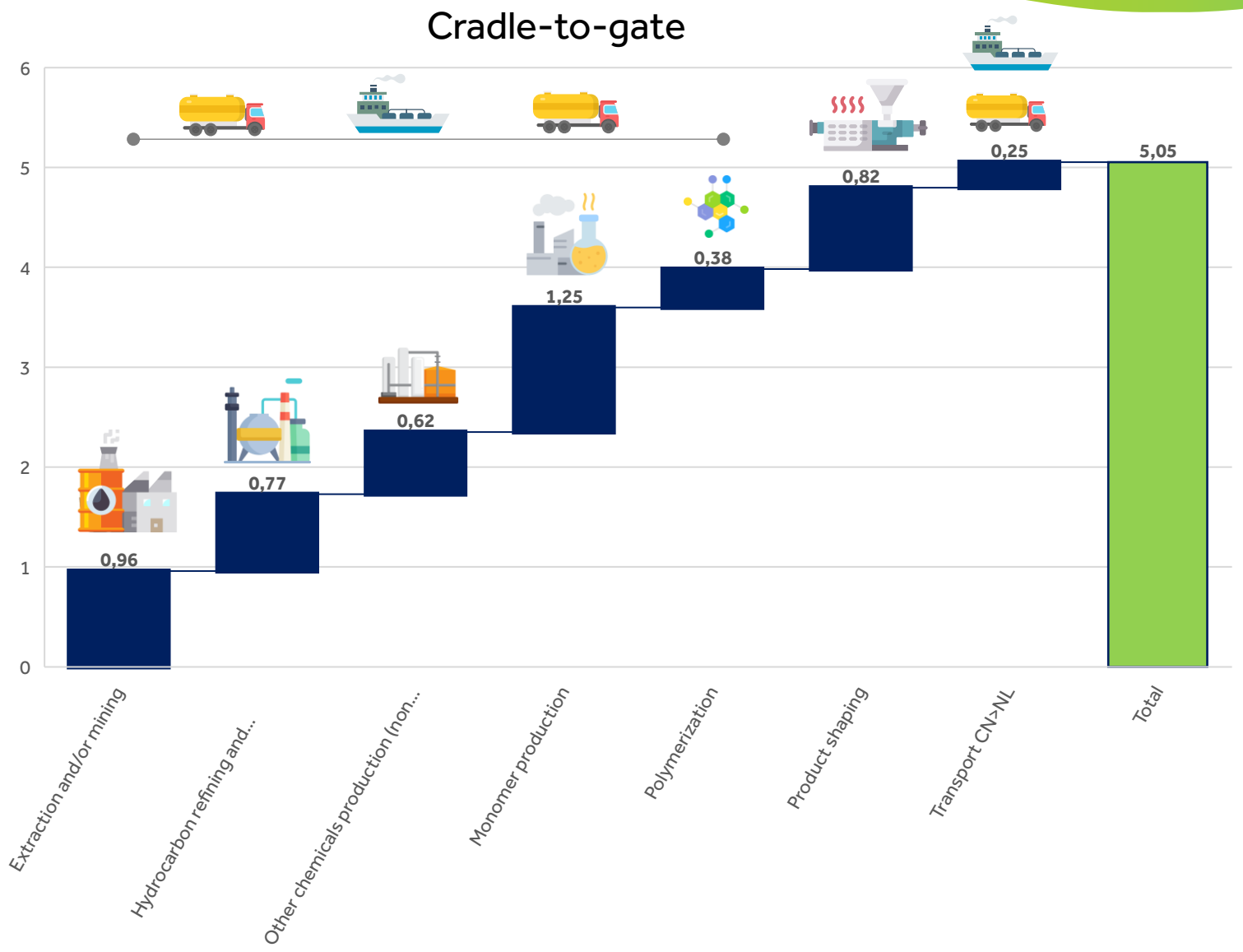
Member	Data requested	Data received
H&P Moulding	Injection moulding data 100% PHBV	Yes
	Injection moulding data PHBV composite	In progress
3-N	3d printing data (?)	No
TKT Plastics	Injection moulding data	No
Bekuplast	Injection moulding data	No
Linotech	Compounding data	No
HS Bremen	PHBV processing data (?) – biocompounds	No
NHL	PHBV Caloric value	Yes
	PHBV processing data (?)	

Supp. Slide Carbon footprint PP





Supp slide. Carbon footprint ABS



Work package 8:

Knowledge transfer & PHA Academy

Gabriela Maldonado

Work package 8

- Goal 1:

Use project results to address other interested companies and ensure **knowledge transfer** regarding practical project results.

The knowledge and experience gained from industry and participating knowledge institutions during the project will be utilised with the **help of Business Development by establishing connections with other project partners and other relevant companies** with specific challenges and ambitions.

- Goal 2:

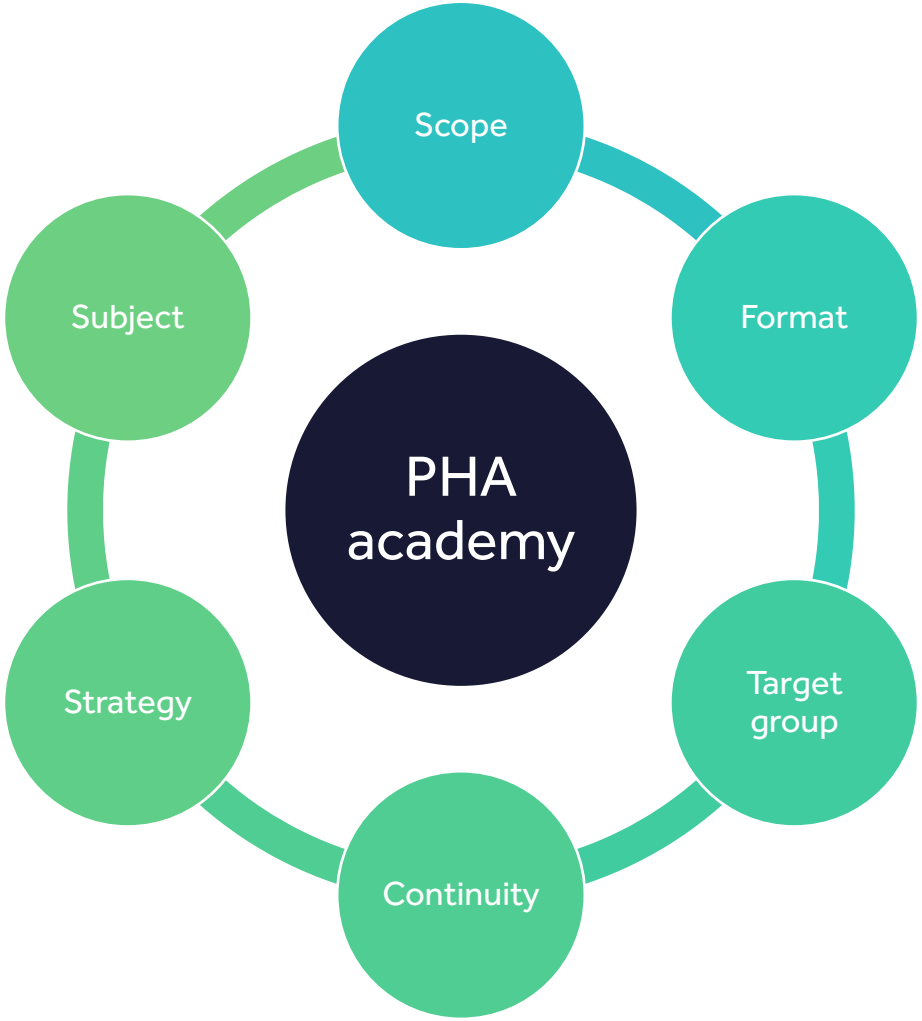
Roll out a PHA Academy to reduce the time gap between production supply and demand for PHA and PHA compounds by **spreading knowledge and awareness about PHA, its benefits and opportunities**.

The PHA Academy is structured as a cooperative where members can learn about the material as well as each other and jointly develop projects around PHA based on the activities in the pedagogical part of the Academy.

Planning


GOAL
• Direction
• Action plan
• Budget
PARTIES
• Inventory
• Contact
ACADEMY developing
• Tutors
• Curriculum
• Members
ACADEMY in progress
Cooperation among members

Important Elements



Group 1

Workshop discussions group 1

- **Target group:** Start with designers. They decide the properties a material needs to have and can help to create a value chain.
- **Scope:** SMB's in combination with research institutes.
- Market-> toys for childeren. And start with non-structural parts because of safety reasons.
- **Format:** First online masterclasses per target group, after that a day to network with more target groups. (And tour in laboraty for example.)
- Forum where people can answer eachothers questions
- **Subject:** Design is about the properties of a material. Processing methods can be easily combined with it. When starting with these two topics, the rest will follow.

PHA Academy

20-30 participants

Technical workshop

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Technicians

Masterclasses + workshop session

Knowledge sharing of Design & Processing Methods

20+ participants

Marketing webinar

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Company staff

1,5 hour webinar

Crash course PHA
+
Focus on sales and marketing

40+ participants

Symposium

~

Company owners + PHA suppliers + end product sellers

Network drinks/lunch

Accesible knowledge with succes stories

Technical Workshop

1 day session

Morning: masterclasses
Afternoon: workshop + networking

Target audience: technicians from companies and knowledge institutes

Tutors

Corinne van Noordenne
Rudy Folkersma
André Heeres
Bart Labrie
Tobias Kohnke/ Anja Lund
Jorg Mussing
Ditmar van Dam

Content

1. Introduction
2. Knowledge sharing via masterclasses
3. Workshop session
4. Networking drinks

Webinar: PHA marketing

1 session

1,5 hour webinar
(Incl. 15 minute of questions)

Target audience: marketing and sales staff from companies

Tutors

PHA expert
PHA marketing/sales expert
PHA legislation expert

Content

1. Crash course on PHA
   a) Material properties
   b) Benefits and drawbacks
   c) Price
   d) Policy/legislation

2. Marketing & Legislation
   a. How to create demand and reach potential costumers?
   b. How to tackle the higher price of PHA products?
   c. How to change legislative barriers?

Symposium

1 afternoon session

Succes stories + networking

Target audience: Company owners + PHA suppliers + end product sellers

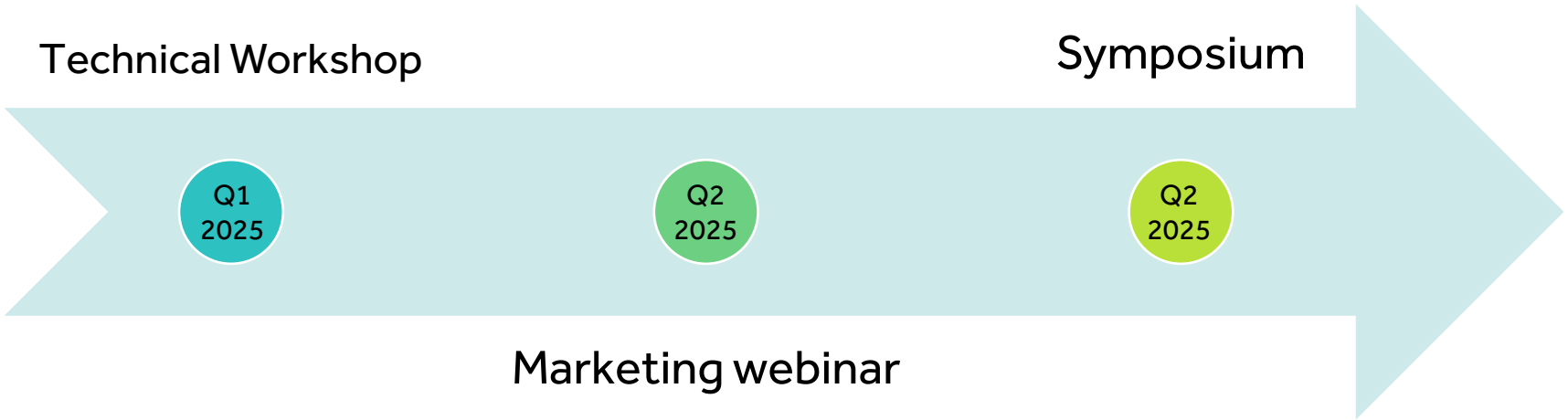
Tutors

Joost Paques (Paques biomaterials)
Jon Donkers (Helian polymers)
Bart Labrie (H&P Moulding)
Rick Passenier/ Anindya Mukherjee (GO!PHA)

Content

1. Introduction
2. Succes stories from company owners
3. Forum discussion over PHA benefits and drawbacks with public interaction
4. Networking drinks

Timeline


Technical Workshop
Symposium
Q1
2025
Q2
2025
Q2
2025
Marketing webinar