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Solidarity
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THE GERMAN BIOECONOMY MONITORING CONCEPT - CONCEPT, METRICS AND INDICATORS -

2nd GIB Meeting, 25-29 May 2025

Metrics and Standards

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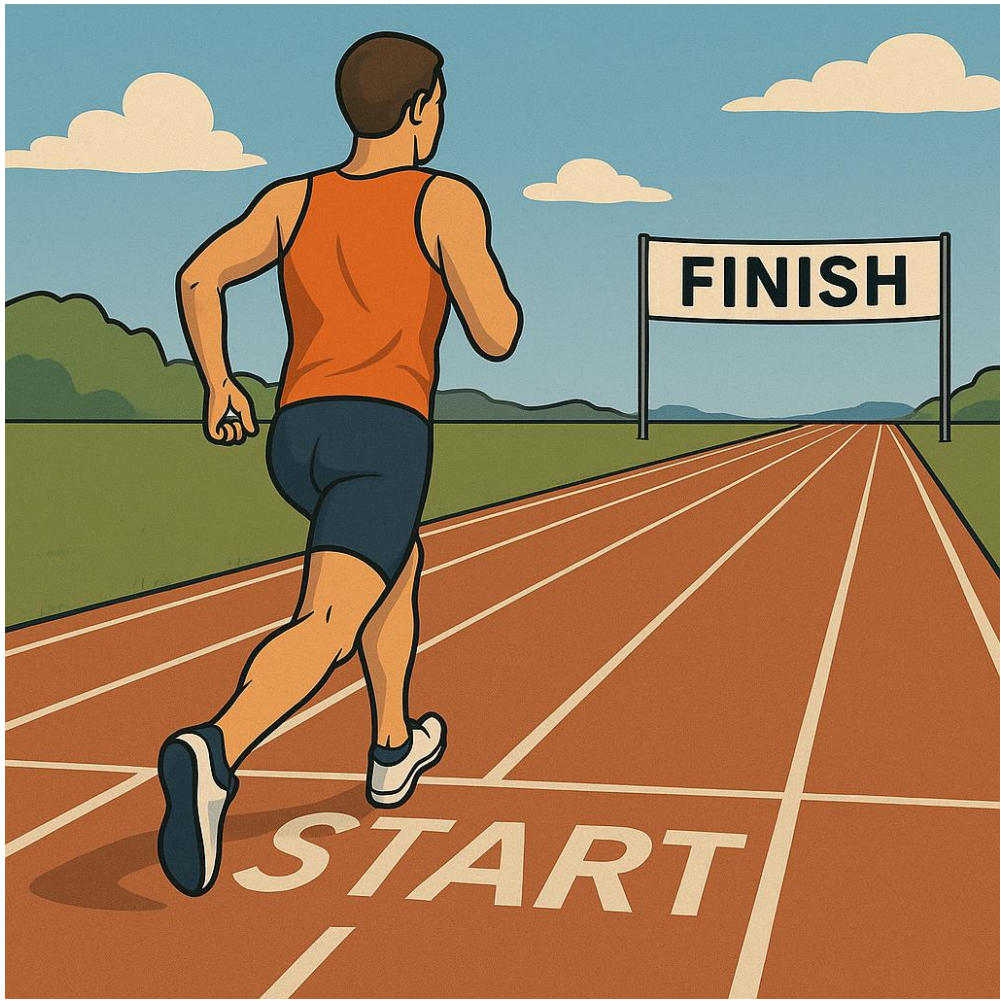
Thünen Institute of Forestry, Germany

28 May 2025

THE GOALS ARE SET



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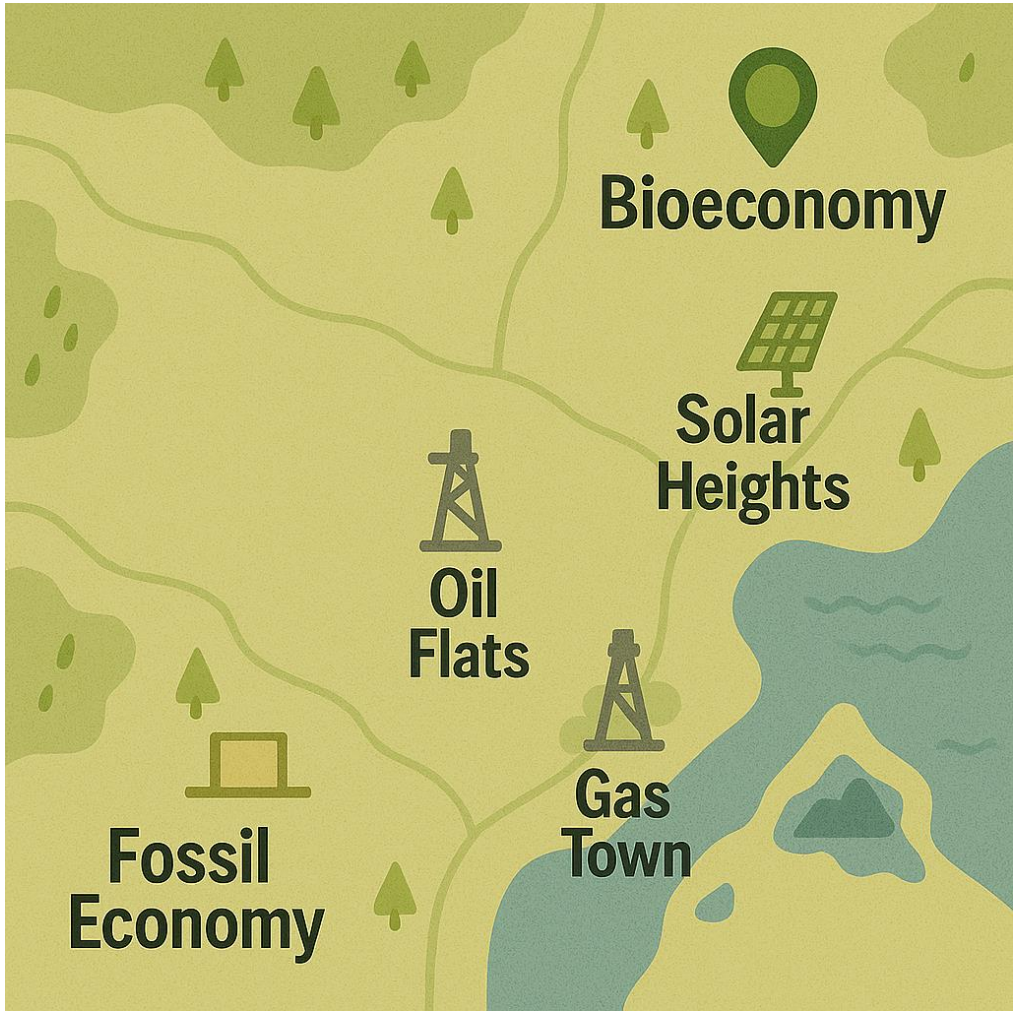
SET YOUR GOALS

1. Develop bioeconomy solutions for the 2030 Agenda for Sustainable Development
2. Recognise and harness the potential of the bioeconomy within ecological boundaries
3. Enhance and apply biological knowledge
4. Establish a sustainable raw material base for industry
5. Promote Germany as the leading location for innovation in the bioeconomy
6. Involve society and strengthen national

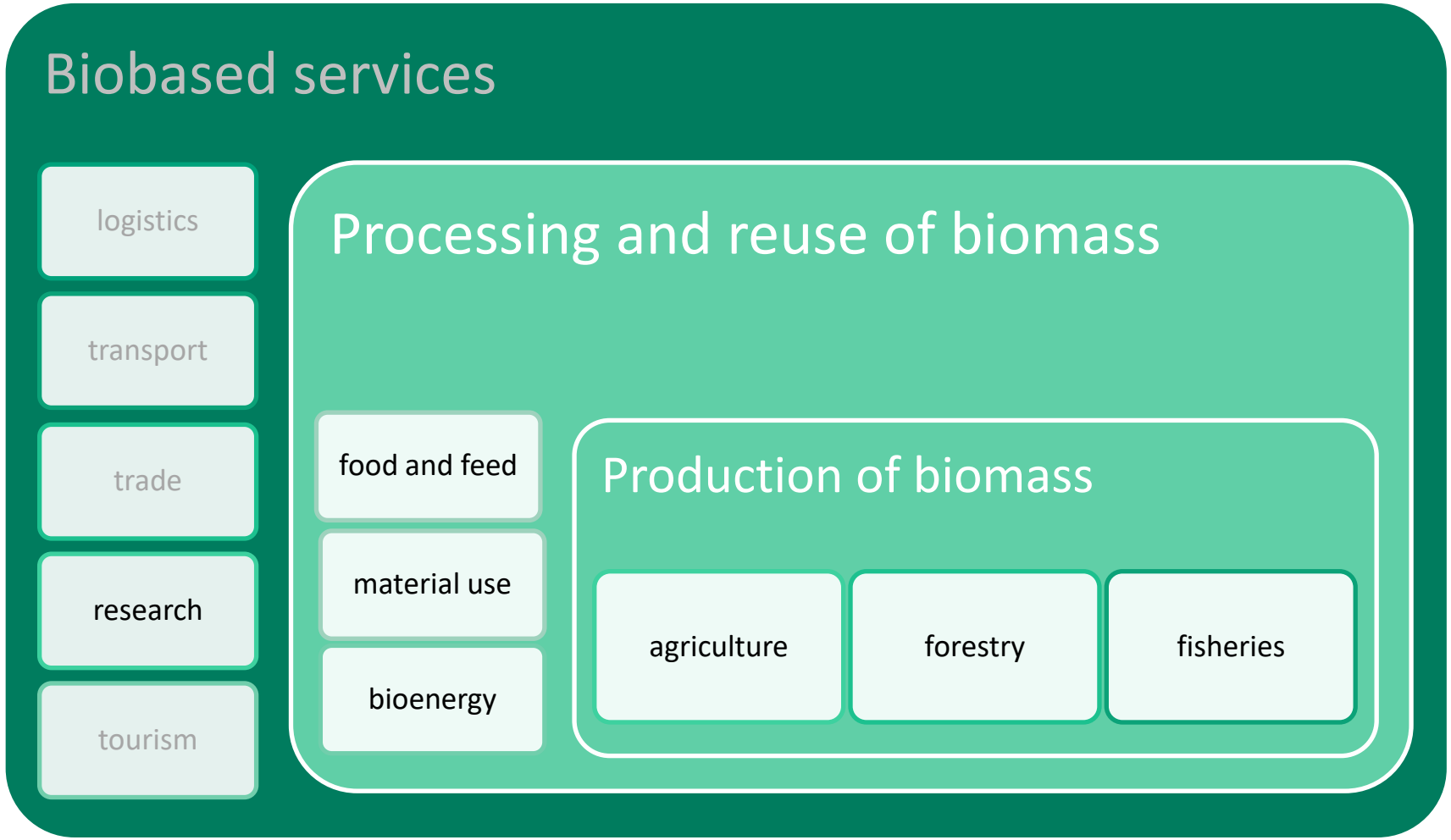
WHERE EXACTLY AM I?



CONVERT GOALS INTO METRICS AND INDICATORS

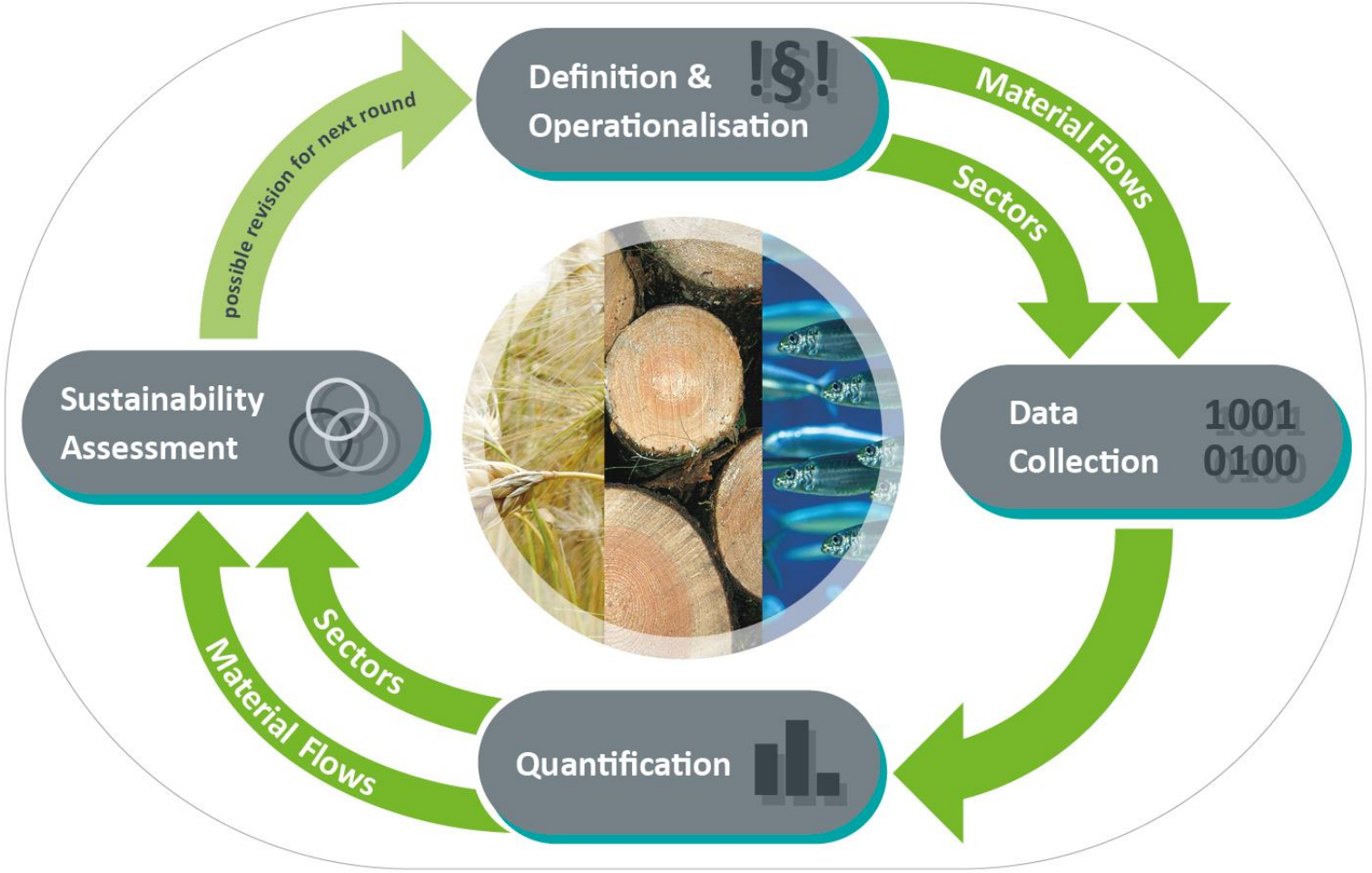
1. Quantification of the contribution of the bioeconomy to the SDGs
2. Quantification of ecological footprints of the bioeconomy
4. Quantification of biomass supply and utilisation and its sustainability effects
5. Quantification of innovation in the bioeconomy

BEFORE YOU START
BE CLEAR WHAT YOU ARE TALKING ABOUT



Source: Iost et al. (2020)

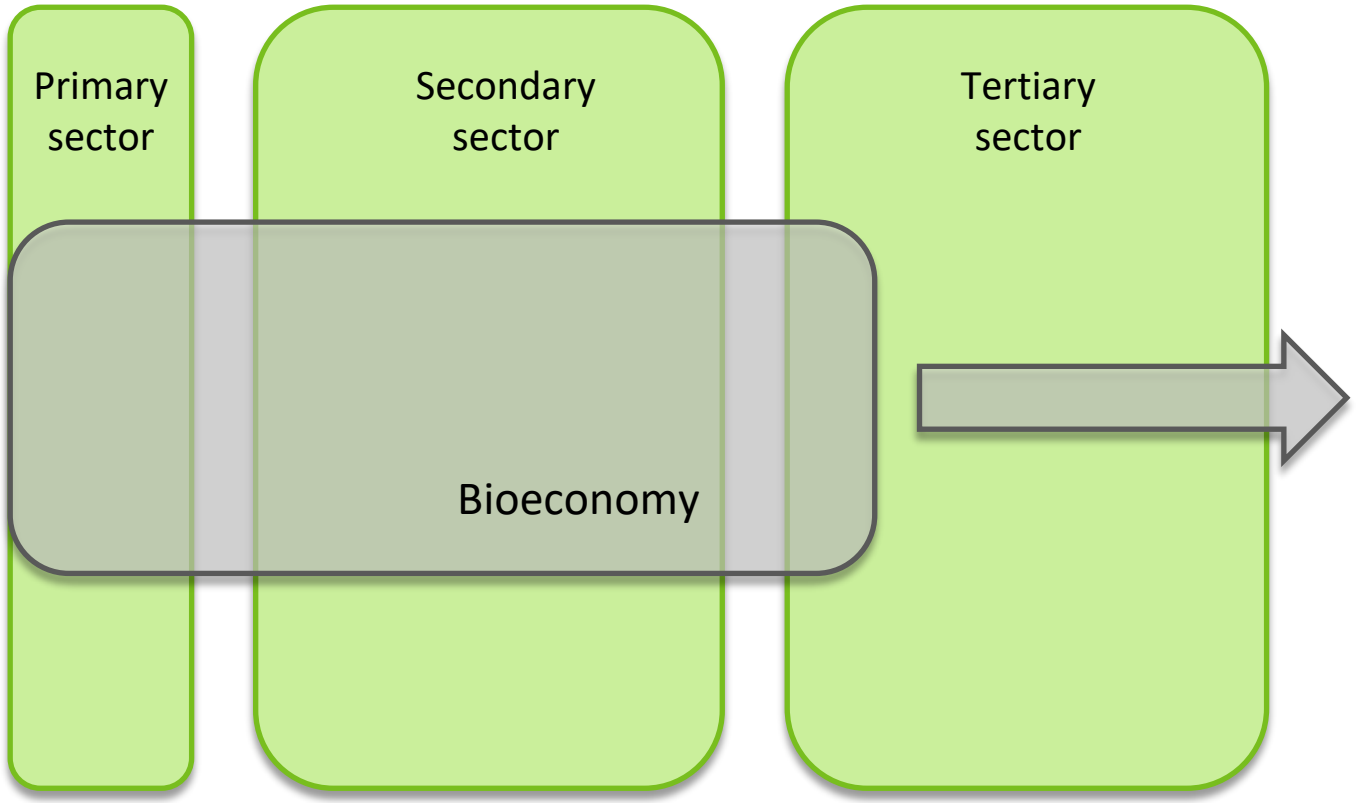
THE CONCEPT



Photos © Tania Runge; Matthias Rütze; iStock/wrangel

Source: Iost et al. (2020)

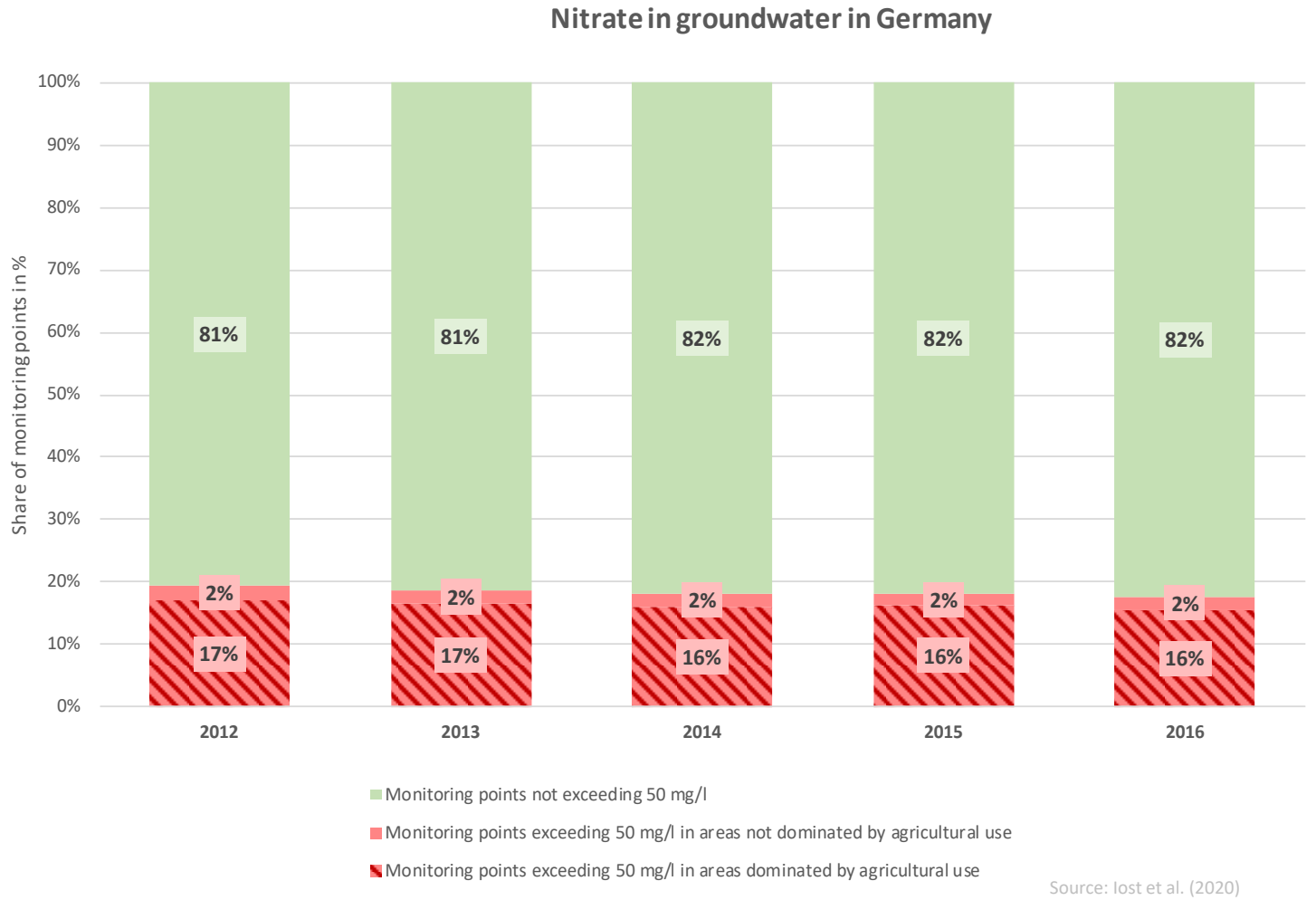
CONTRIBUTION OF THE BIOECONOMY TO THE SDGs



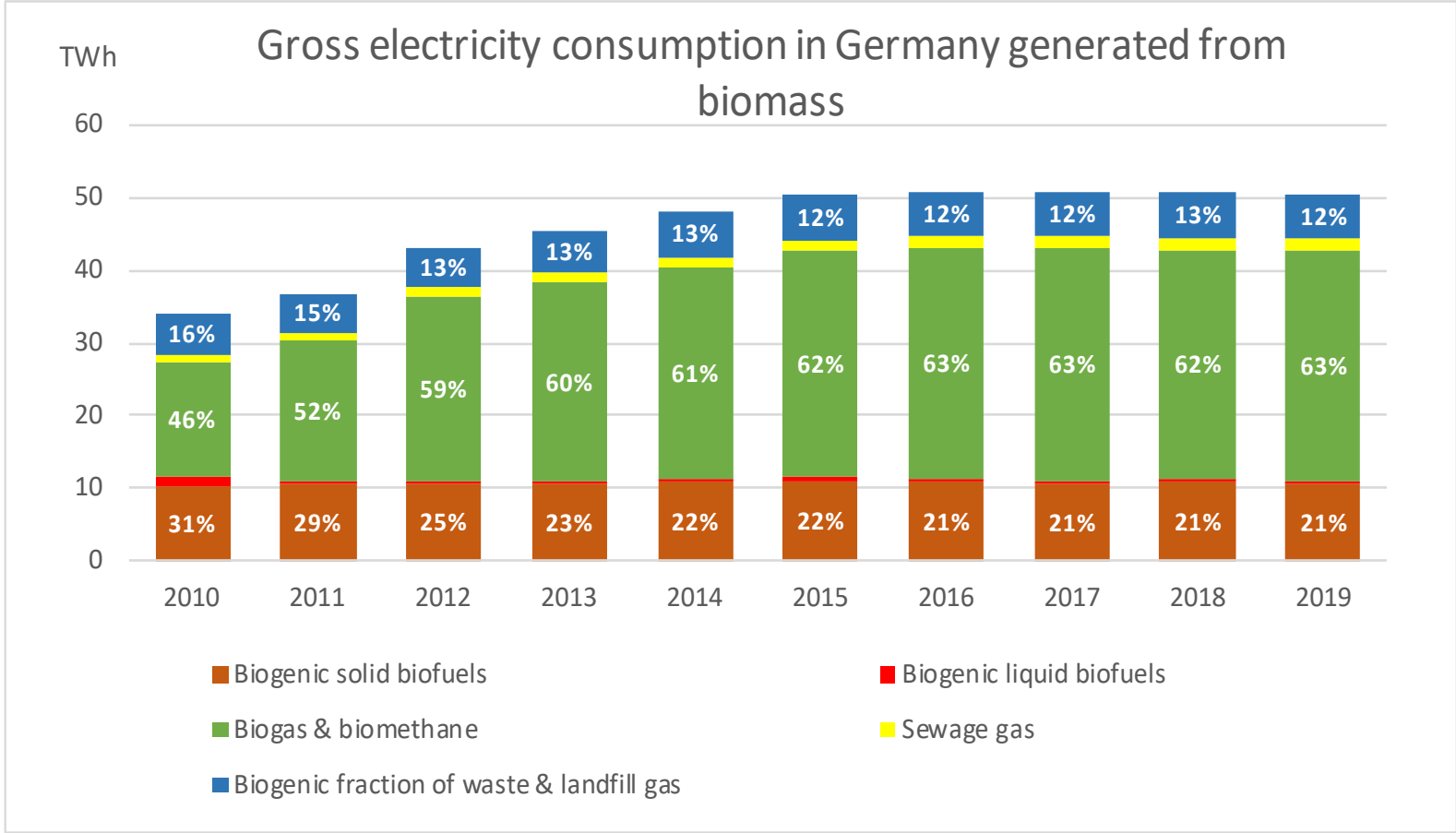
27 indicators of the German Sustainability Strategy

Source: UN

NITRATE IN GROUNDWATER
SDG 6



GROSS ELECTRICITY CONSUMPTION GENERATED FROM BIOMASS
SDG 7



Source: Iost et al. (2020)

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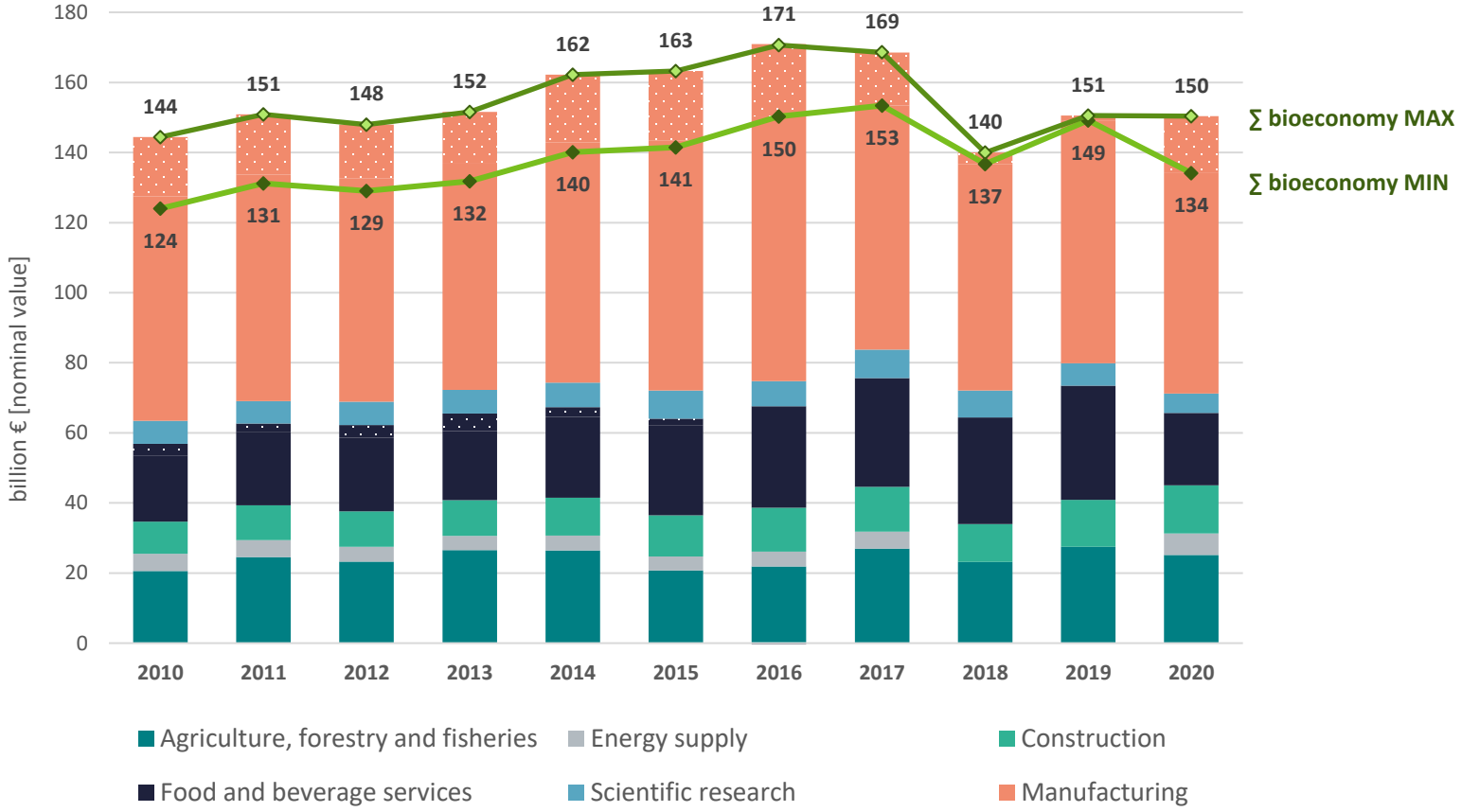
GROSS VALUE ADDED
SDG 8



Source: own calculations, Eurostat, Destatis

THE POTENTIAL OF THE BIOECONOMY WITHIN ECOLOGICAL BOUNDARIES

Agricultural biomass footprint

tonnes per capita in 2021

Timber footprint

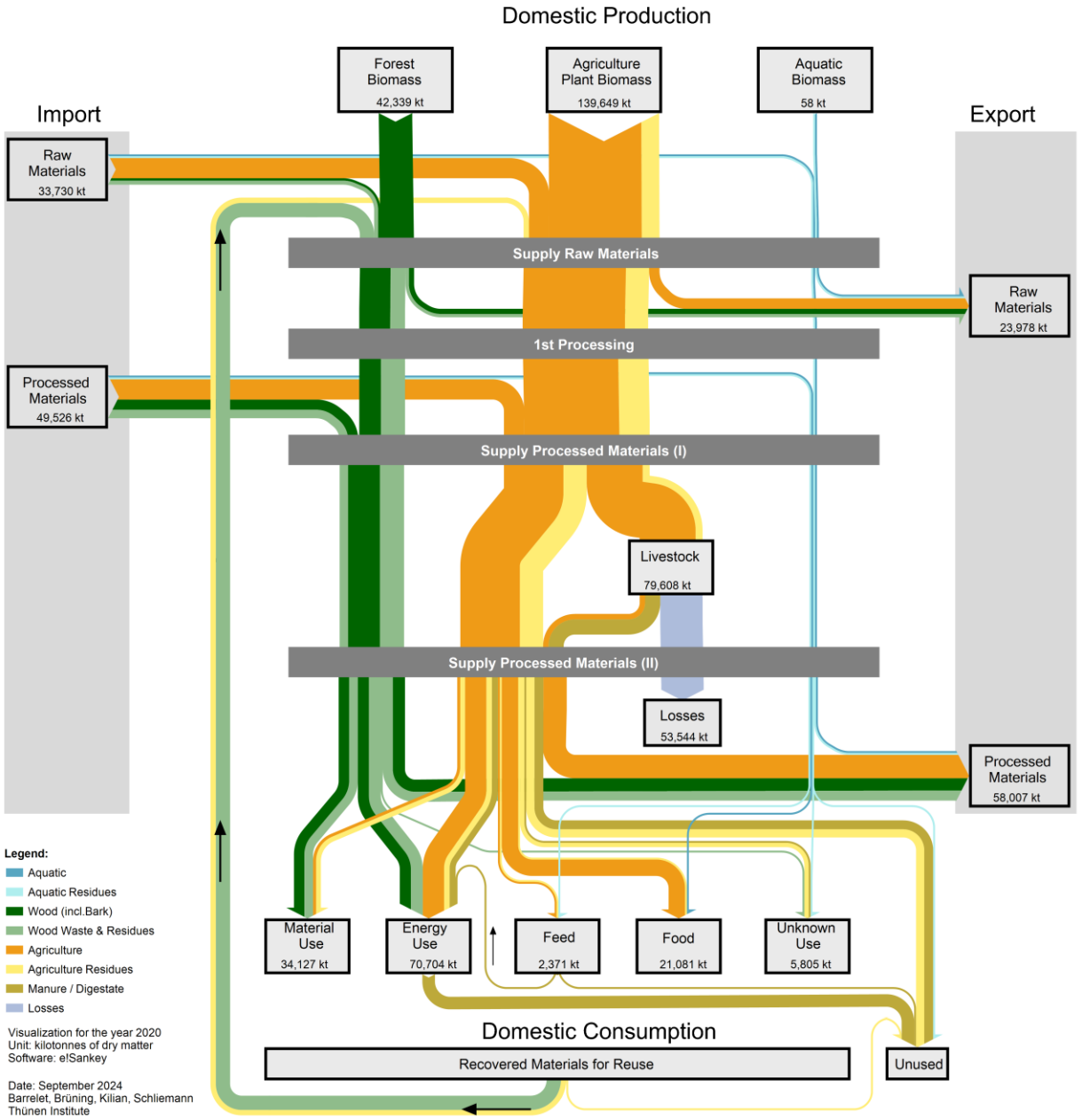
cubic meters roundwood equivalents for industrial use per capita in 2021

Water footprint

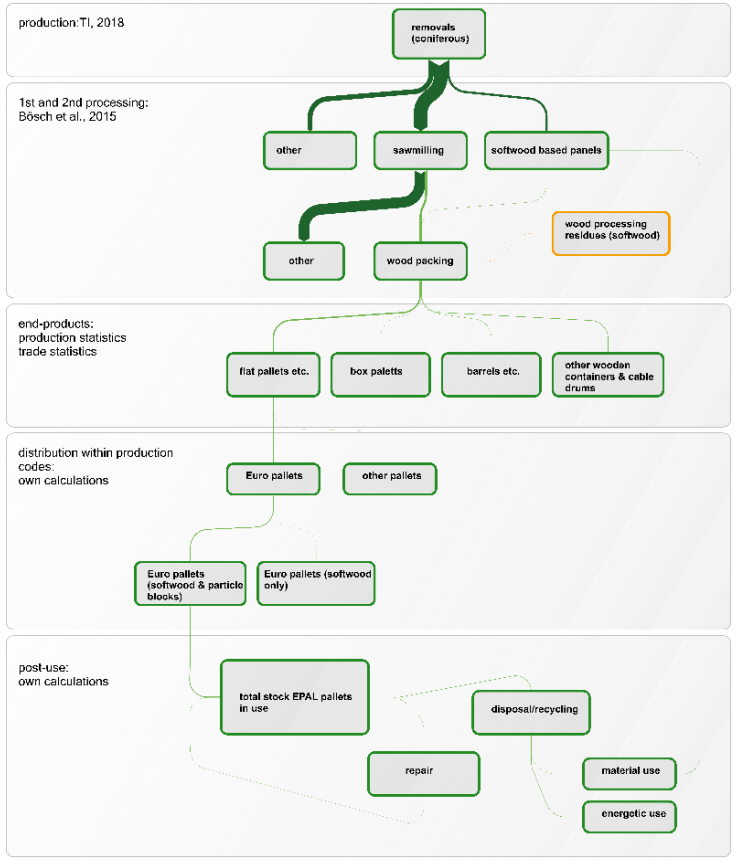
Cubic meters per capita in 2020

Source: Beck O'Brien et al (2024)

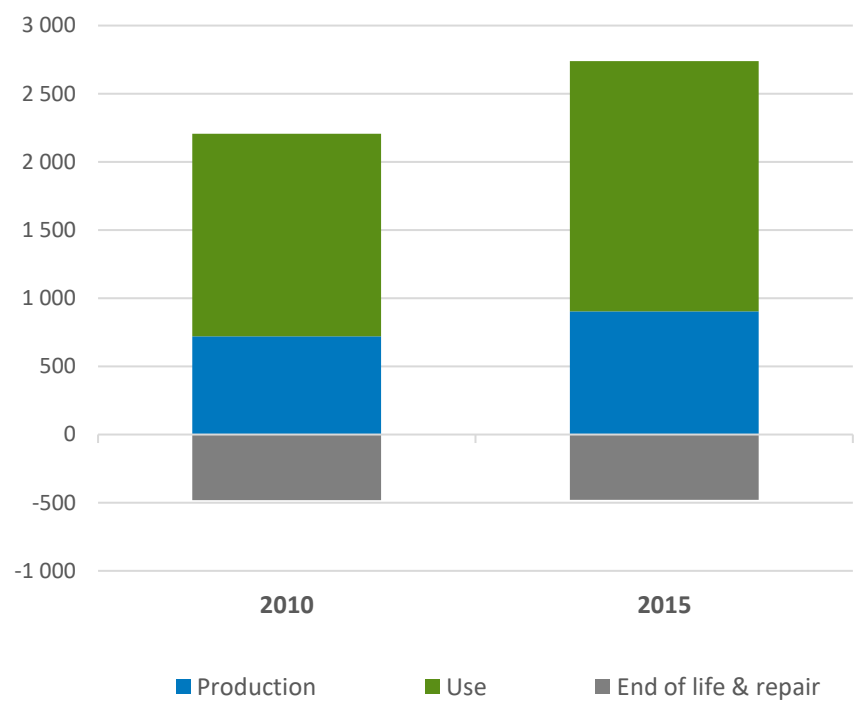
HOW MUCH BIOMASS IS OUT THERE?



…. AND HOW SUSTAINABLE IS IT?

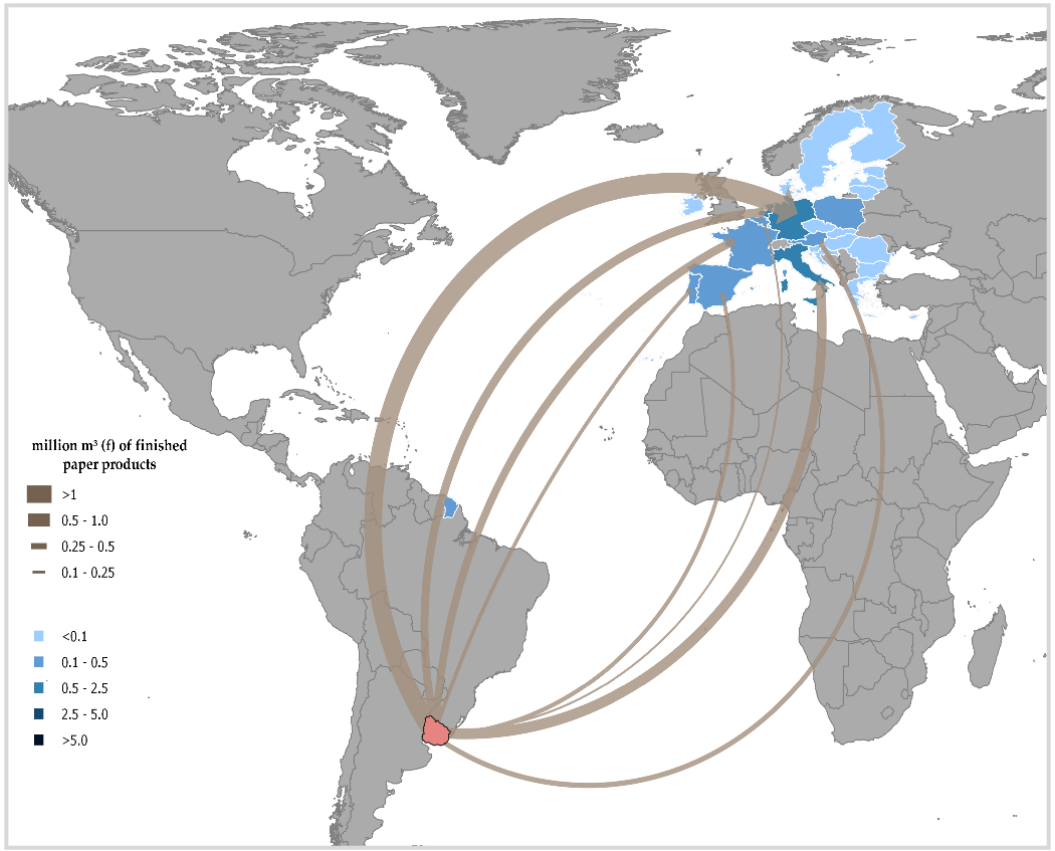


Global Warming Potential of a wood pallet

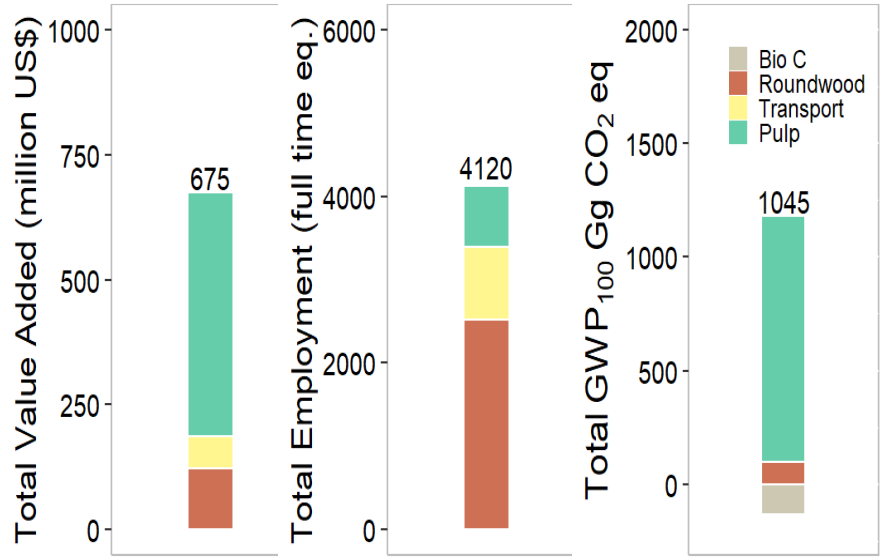


Source: Schweinle et al. (2020)

.... AND HOW SUSTAINABLE IS IT?



Sustainability effects of imported pulp from Uruguay



Source: Pozo et al. (2024)

INNOVATION IN THE BIOECONOMY

Comparatively high*

Innovative wood products (44)
Agriculture 4.0 (55)
Bio-based surfactants (66)

Increasing since 2009

Comparatively low*

Biotechnology (-47)
Biopharmaceuticals (-55)
Plant breeding (-59)
Microbiomes (-71)

Decreasing since 2009

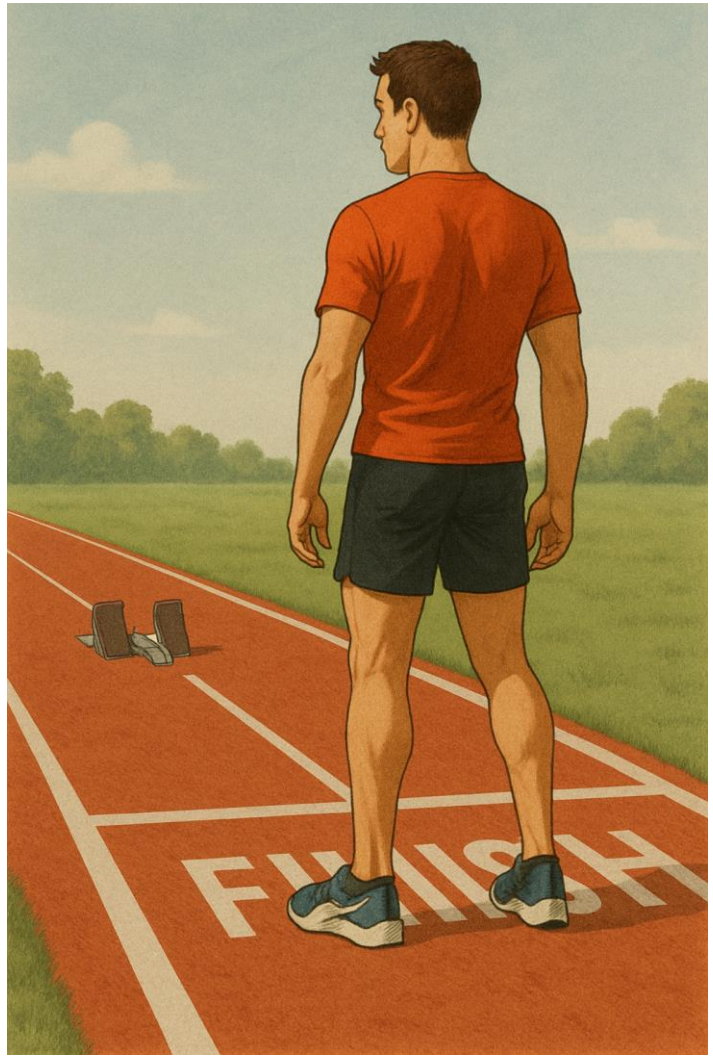
* Relative patent advantage index (2019 – 2022) for Germany

Source: Beck O'Brien et al (2024)

CHALLENGES

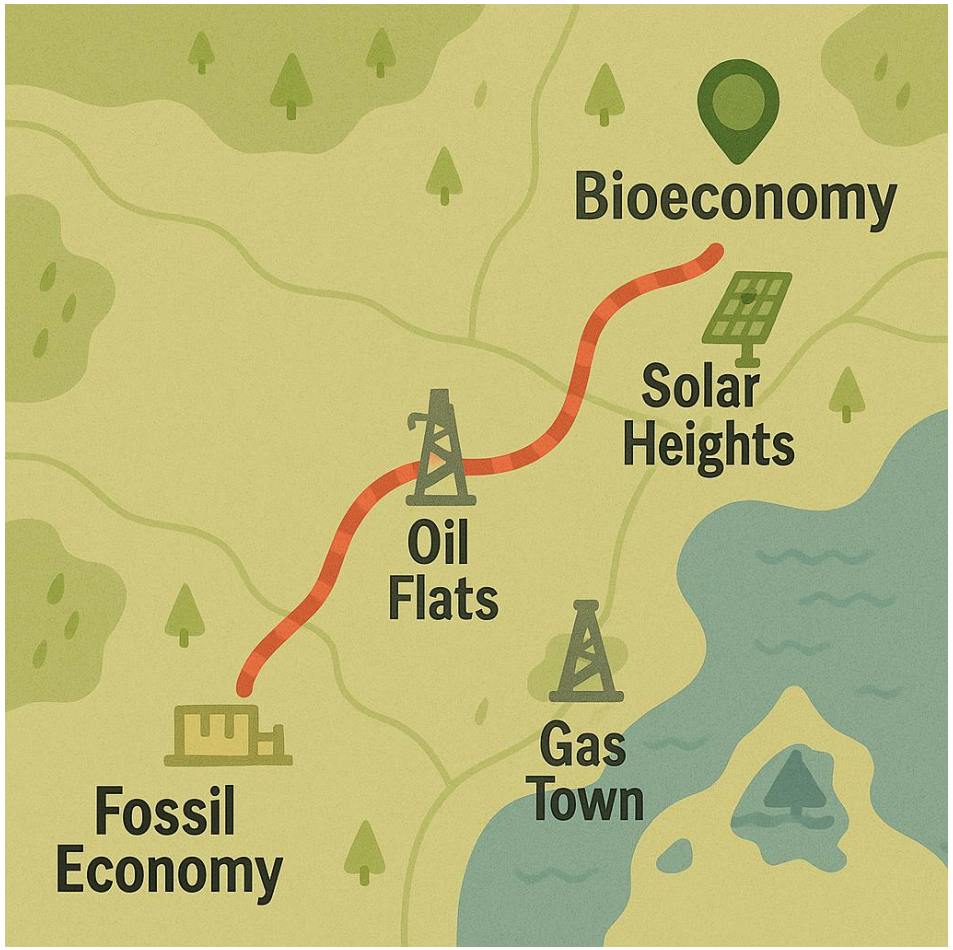
- Data availability
- National accounts and statistics do not reflect the structure of the bioeconomy
- Identification and quantification of emerging products and technologies
- Assessment of innovation

THINK FROM THE END BEFORE YOU START



SET YOUR GOALS
DRAW YOUR ROADMAP
SELECT METRICS, INDICATORS AND DATA PROVIDERS

DO IT AT THE SAME TIME



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Thank you