



IEA Bioenergy
Technology Collaboration Programme

Task 42
Biorefining in a circular economy



Country report: Germany

Bioenergie and bio-based products

Heinz Stichnothe, Thünen Institute

Braunschweig, July 2023

The IEA Bioenergy Technology Collaboration Programme (TCP) is organised under the auspices of the International Energy Agency (IEA) but is functionally and legally autonomous. Views, findings and publications of the IEA Bioenergy TCP do not necessarily represent the views or policies of the IEA Secretariat or its individual member countries.

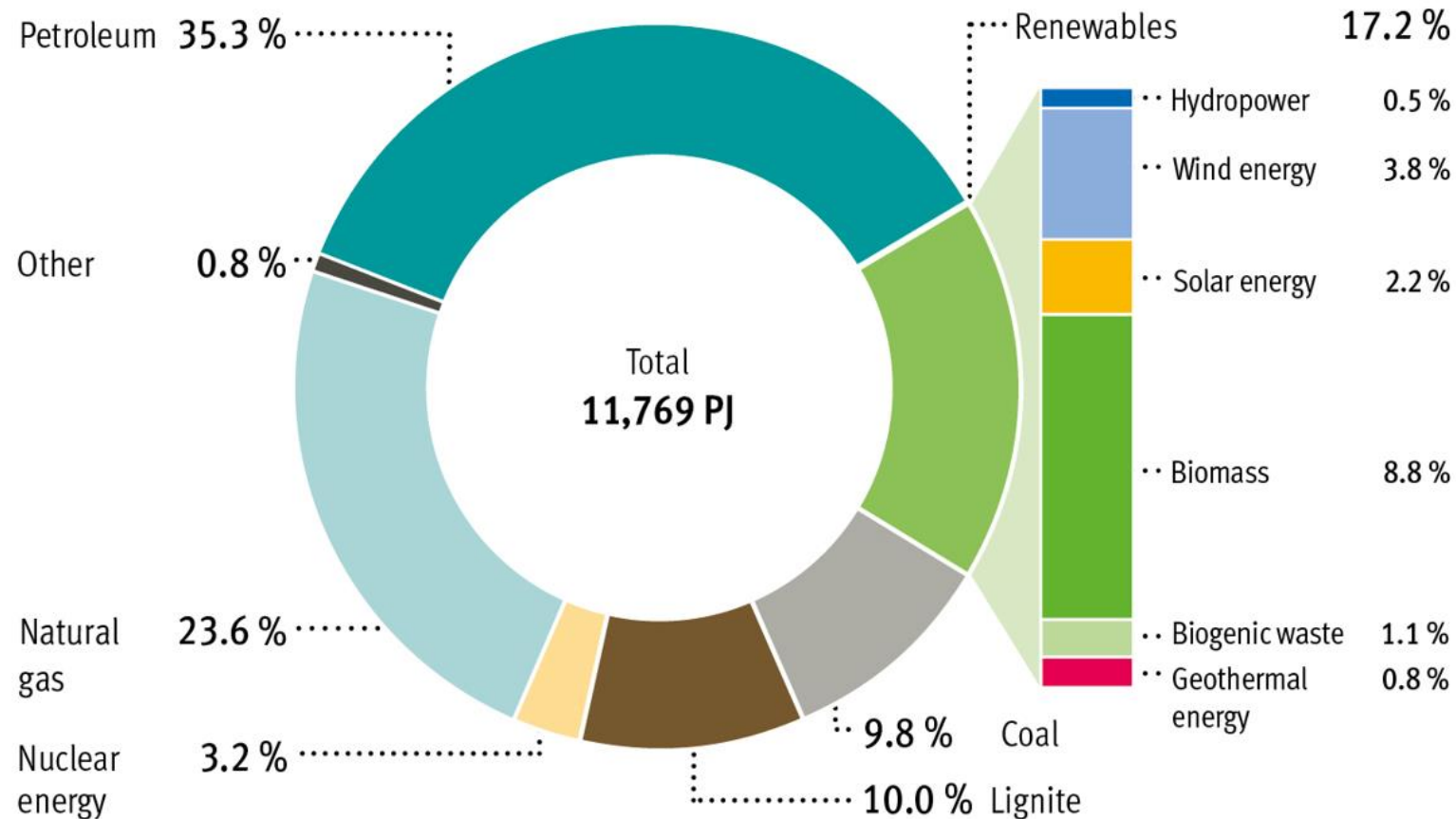
Technology Collaboration Programme

by **iea**

Agenda

- Energy
 - Primary - total and from renewables
 - Electricity
 - Heat
- Biomass use
 - Types of biomass
 - Use in the chemical industry
- Bioeconomy
 - Turnover
 - Employees in various sectors of the bioeconomy
- Bioplastics
 - Global production capacity
 - Market share
- Success stories

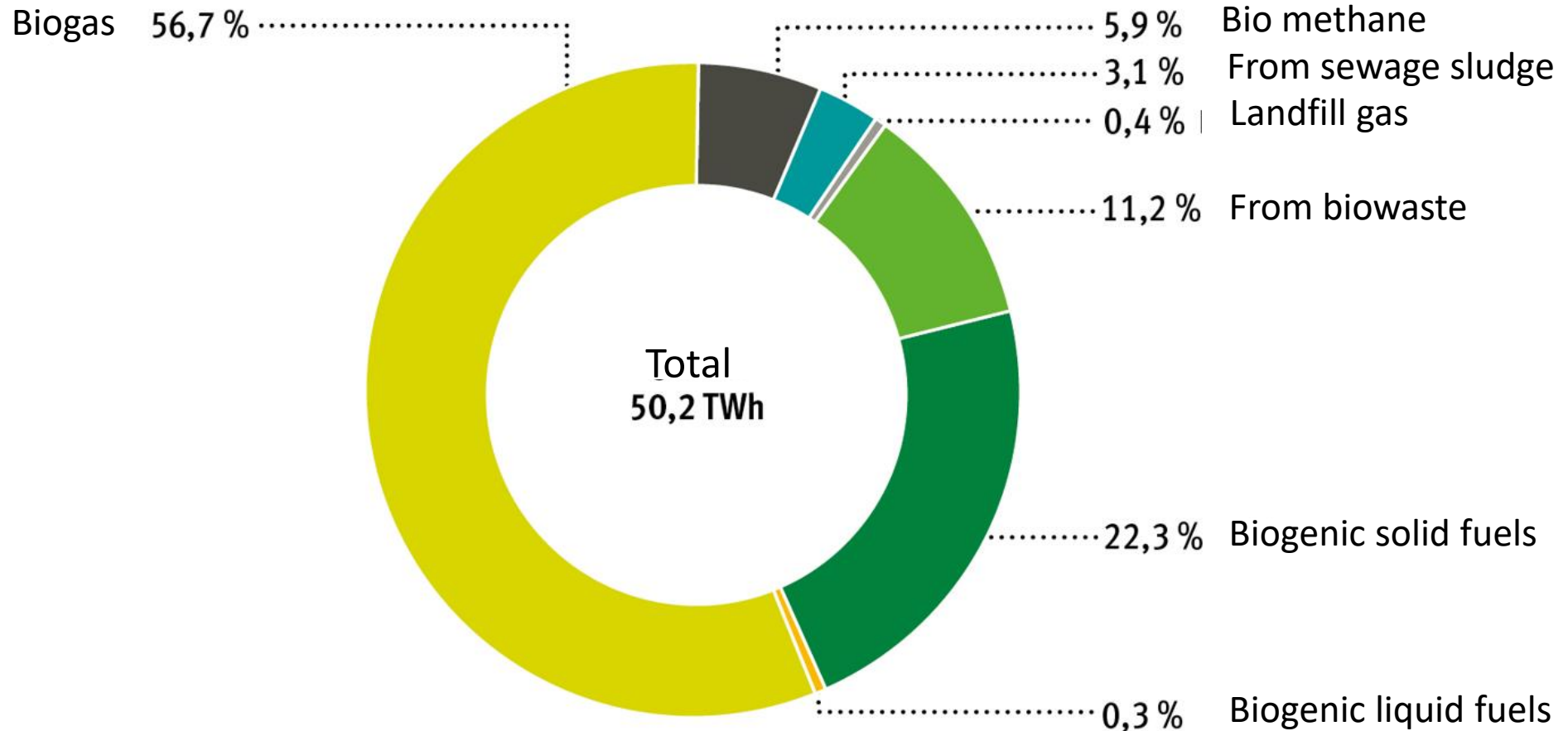
Primary energy consumption in 2022



Source: FNR based on AGEB, AGEE-Stat (March 2023)
© FNR 2023



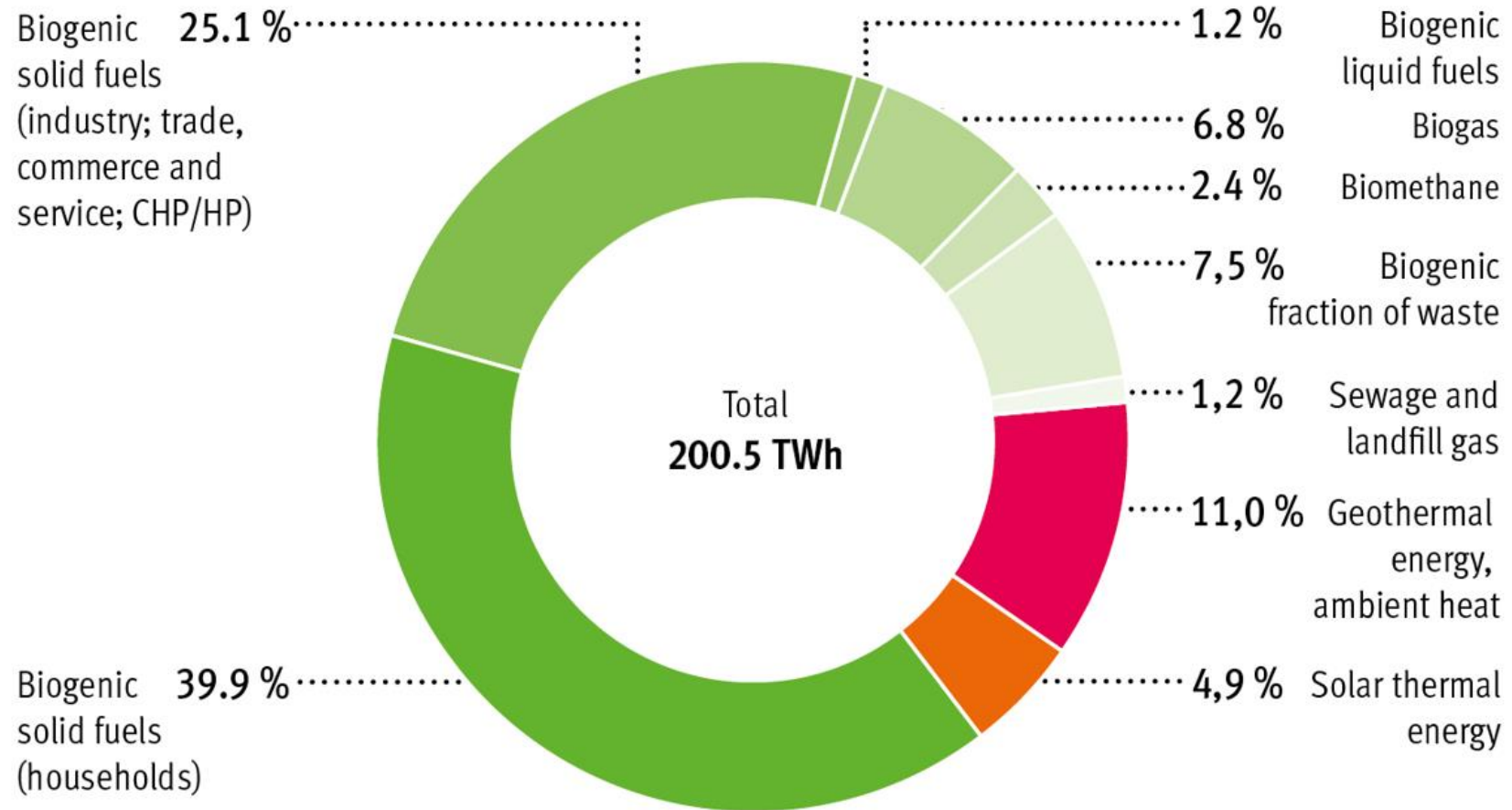
Electricity generation from biomass in 2022



Quelle: BMWK, AGEE-Stat (Februar 2023)
© FNR 2023



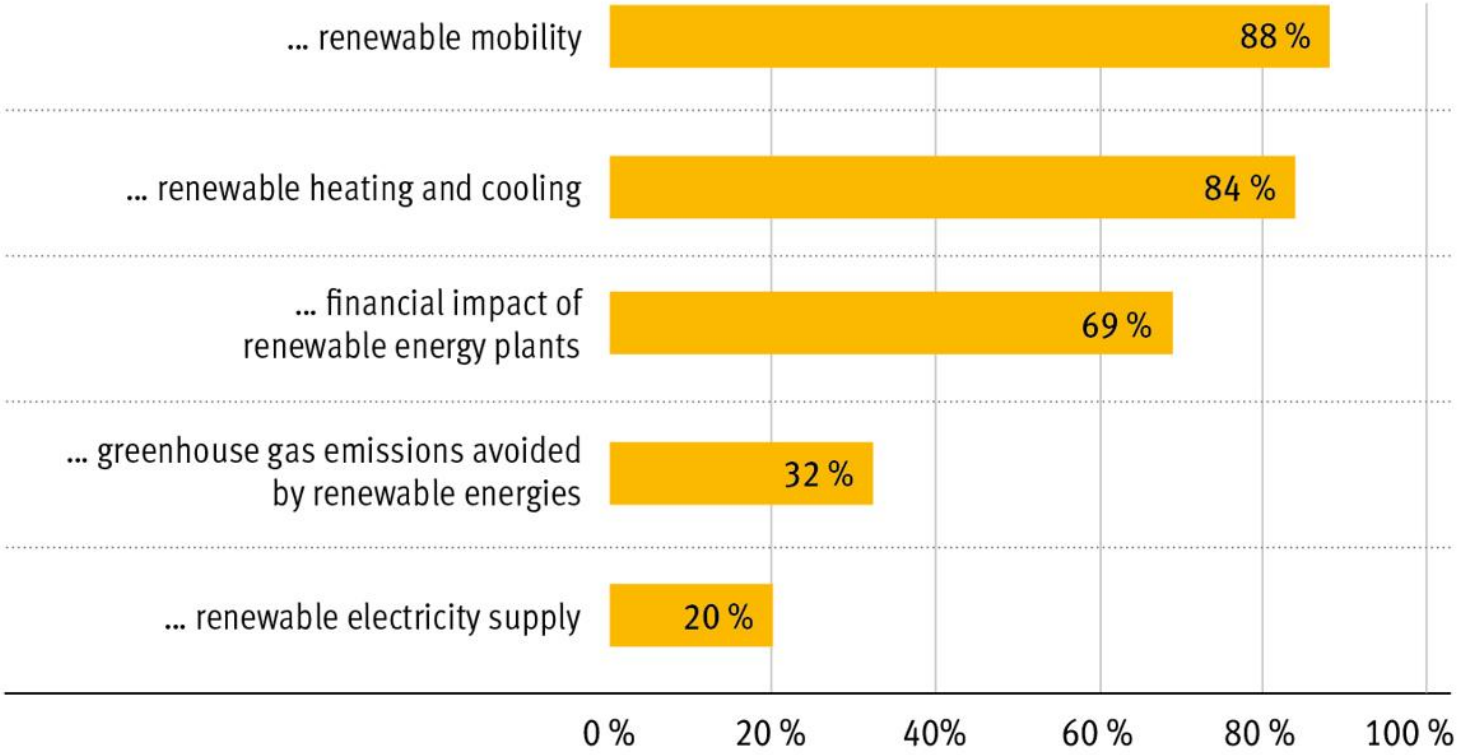
Heat from renewables in 2022



Source: BMWK, AGEE-Stat (February 2023)
© FNR 2023

Bioenergy's contribution in 2022

Contribution of bioenergy to

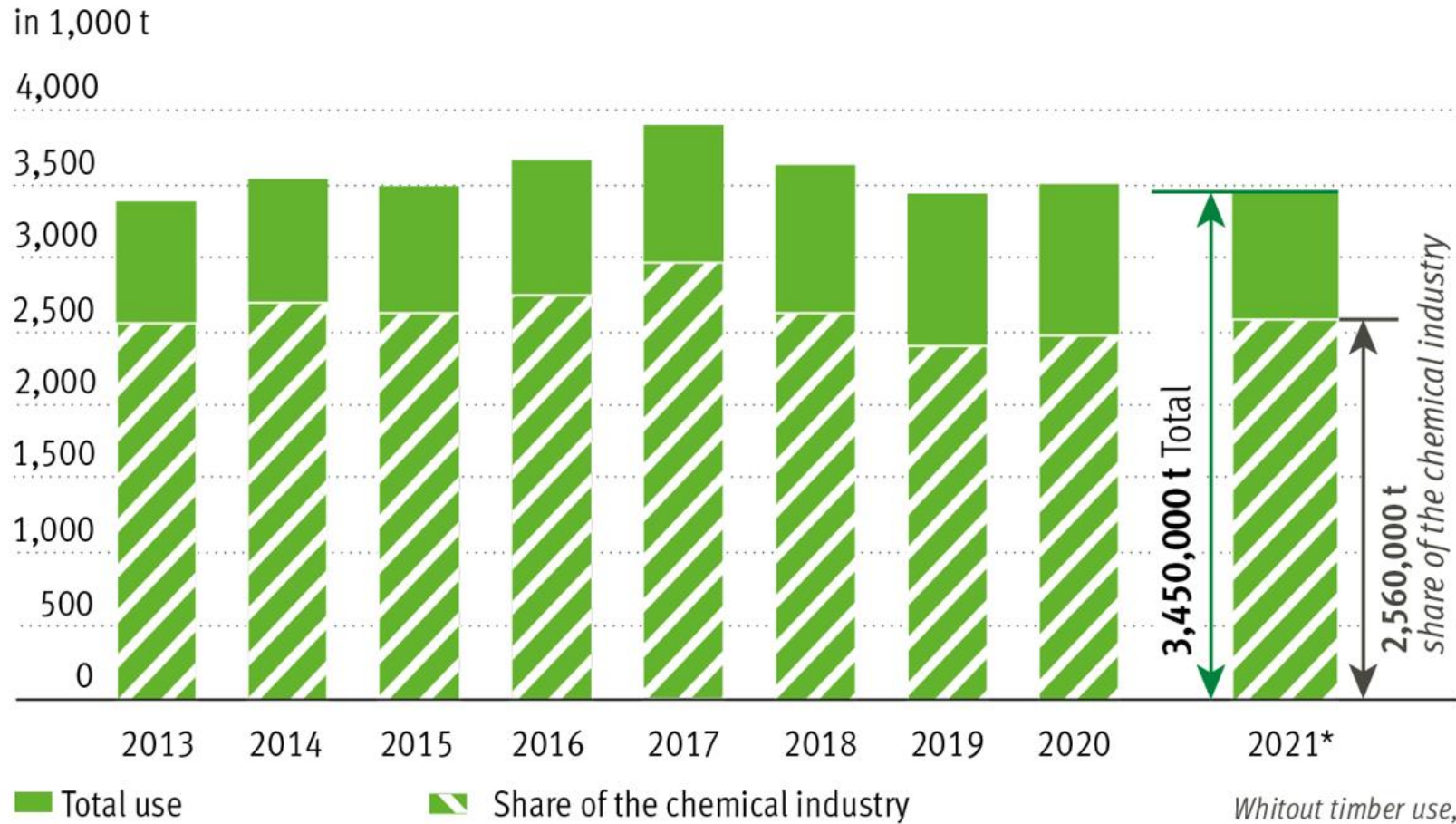


Data for Germany 2022

Source: BMWK, AGEE-Stat (February 2023)
© FNR 2023



Development of material use of renewables



Whitout timber use,
*provisional estimate

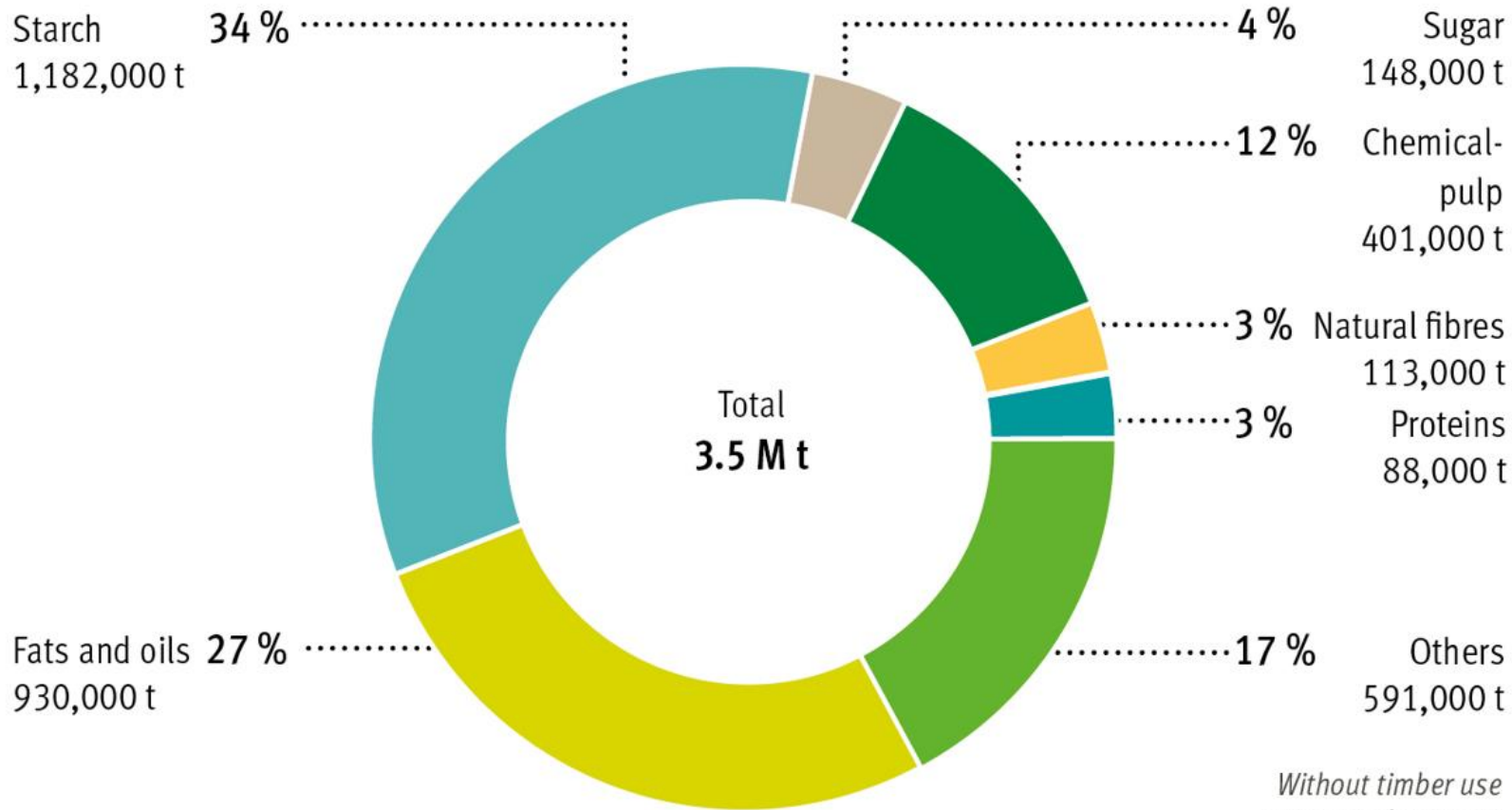
Source: FNR, BMEL (2023)
© FNR 2023

Task 42
Biorefining in a circular economy



www.ieabioenergy.com
http://task42.ieabioenergy.com

Material use of renewables in 2021

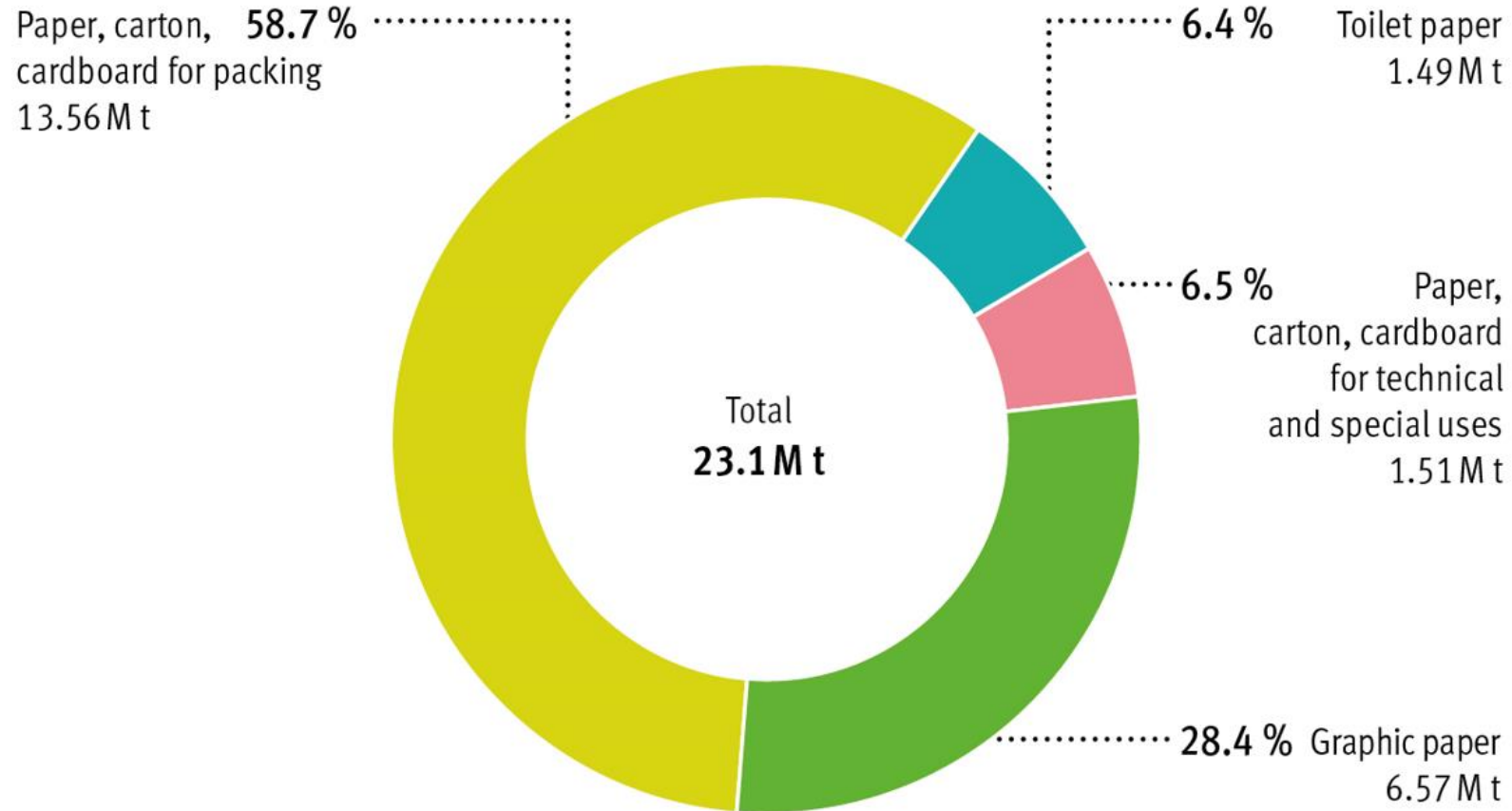


*Without timber use
provisional estimate*

Source: FNR, BMEL (2023)
© FNR 2023



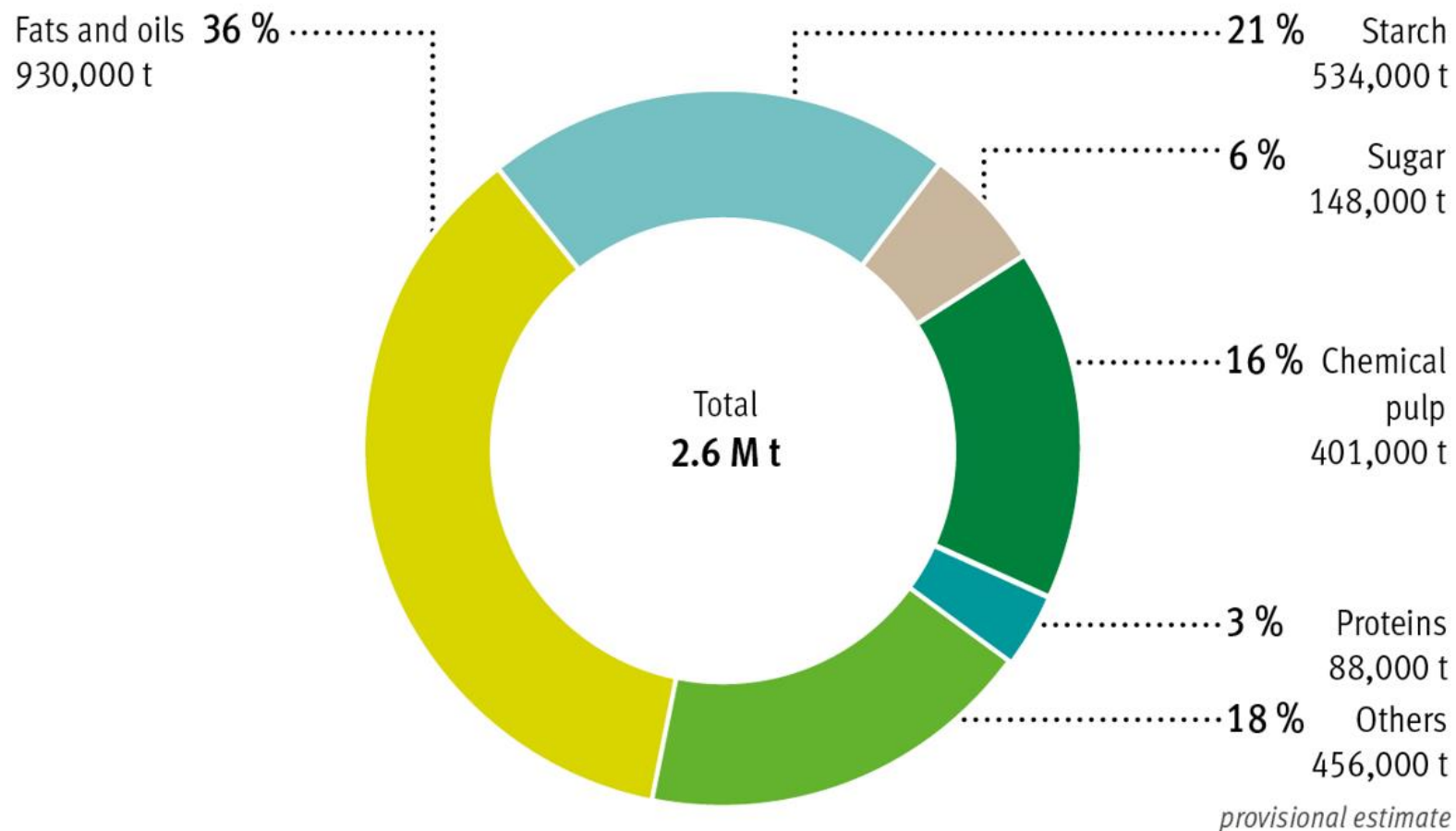
Production of paper, carton, and cardboard in 2021



Source: Verband Deutscher Papierfabriken e.V. (2021)
© FNR 2022



Renewable material use in the chemical industry

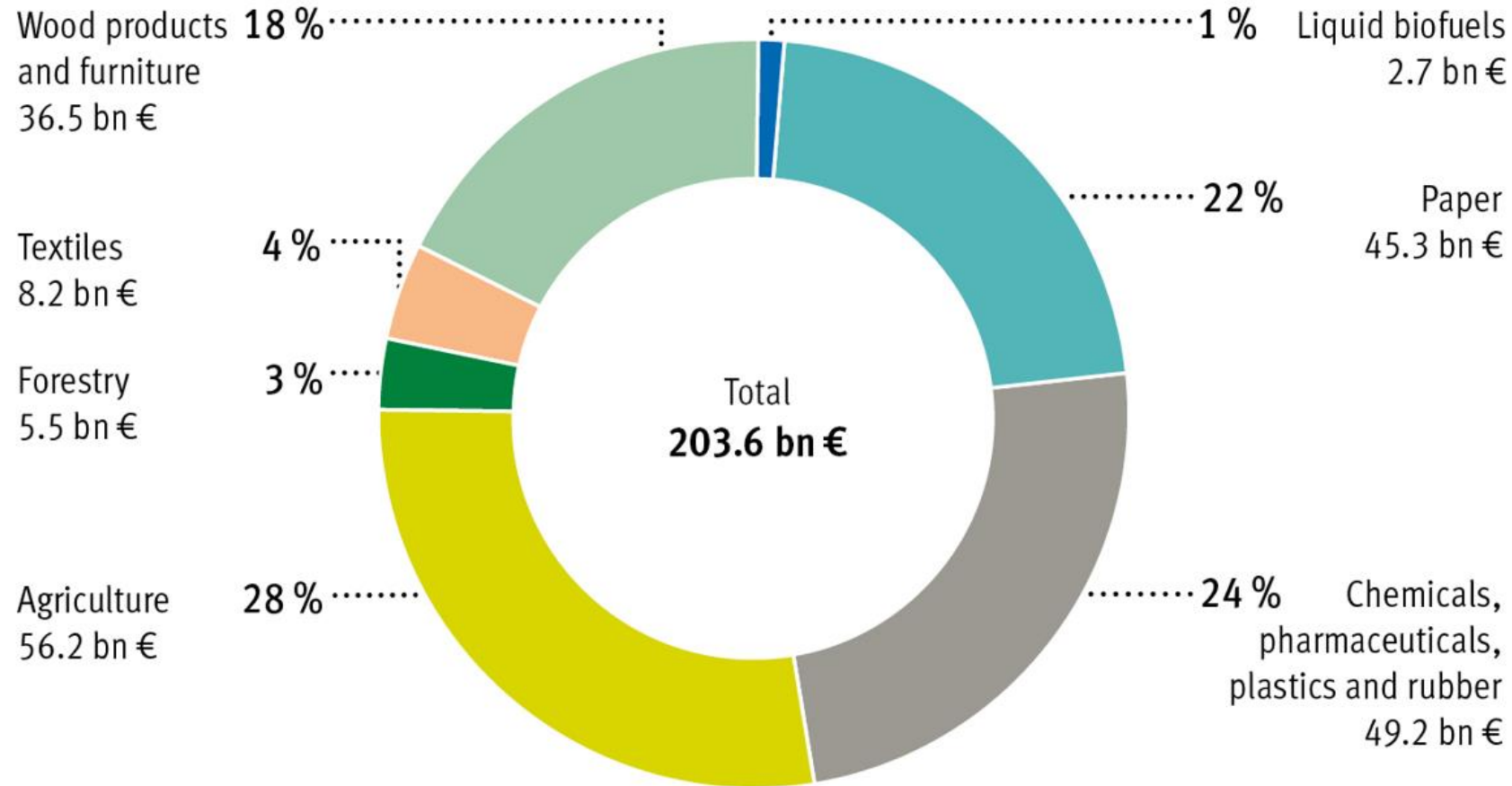


Source: FNR, BMEL (2023)
© FNR 2023

Task 42
Biorefining in a circular economy



Turnover in the biobased economy in 2019



Source: https://knowledge4policy.ec.europa.eu/bioeconomy/topic/economy_en, abgerufen am 27.07.2022

© FNR 2022

Task 42

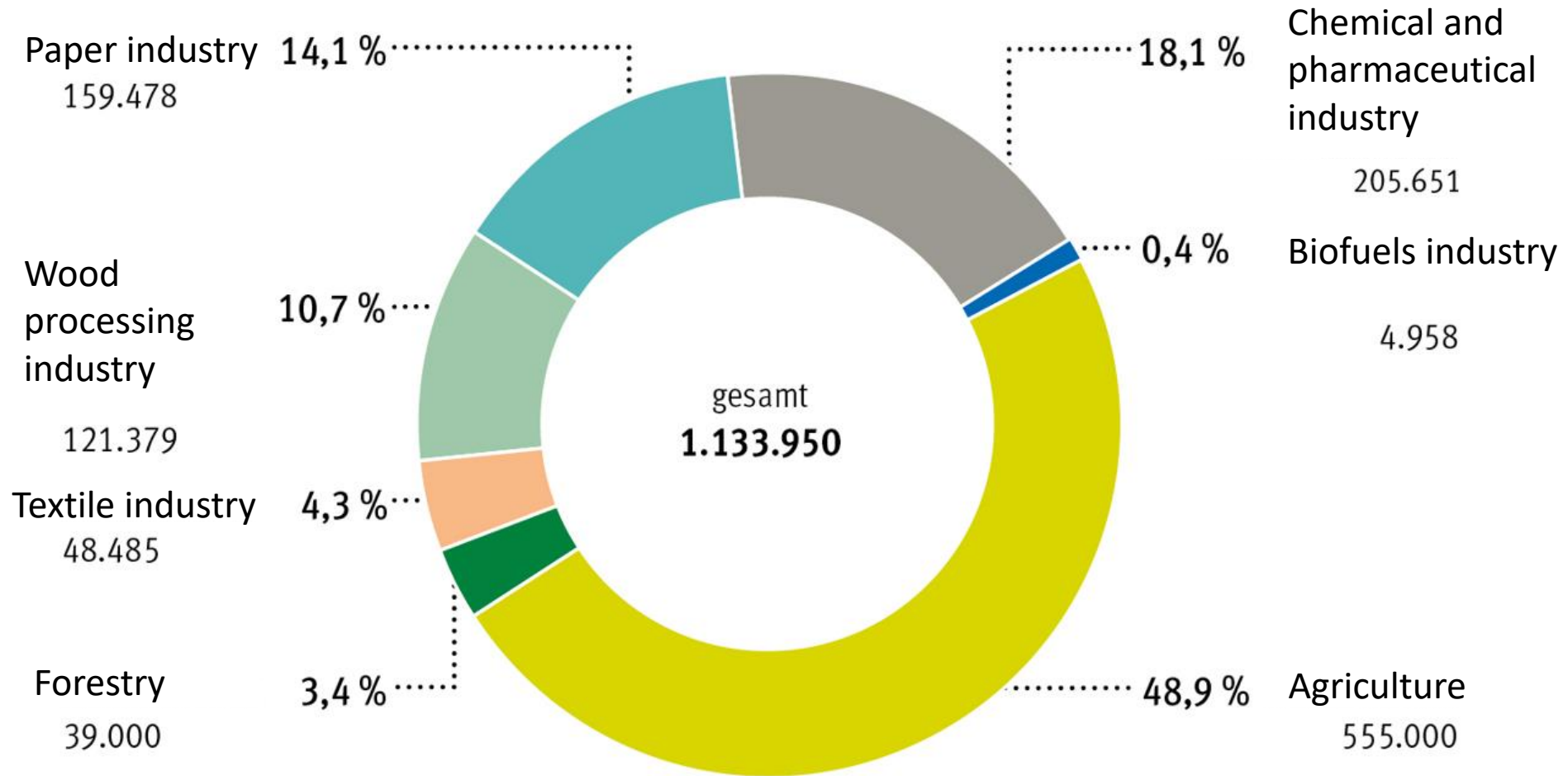
Biorefining in a circular economy



www.ieabioenergy.com

<http://task42.ieabioenergy.com>

Employees in the bioeconomy in 2019



Bioökonomie auf Basis nachwachsender Rohstoffe

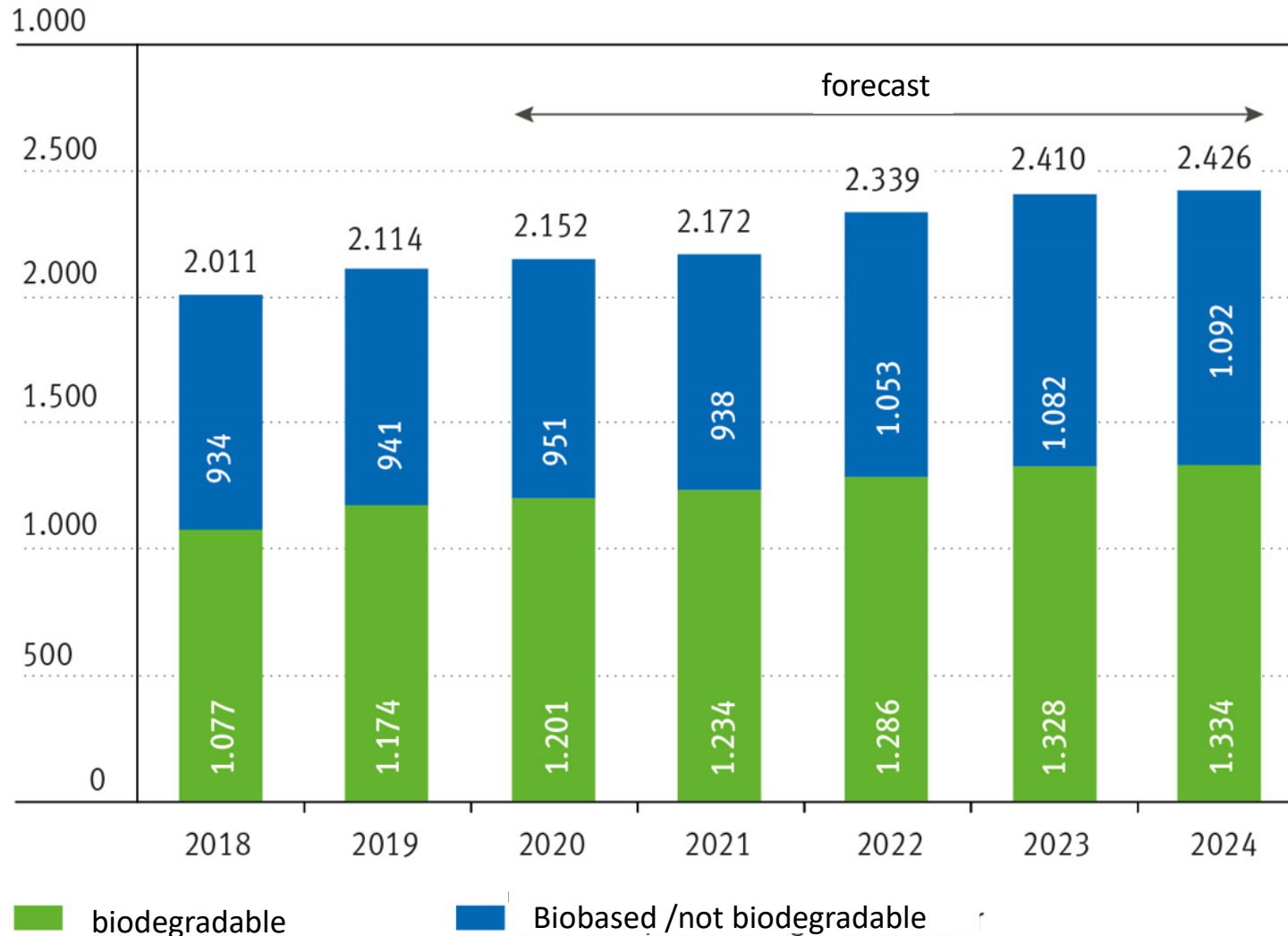
Quelle: https://knowledge4policy.ec.europa.eu/bioeconomy/topic/economy_en, abgerufen am 27.07.2022

© FNR 2022

Task 42

Biorefining in a circular economy

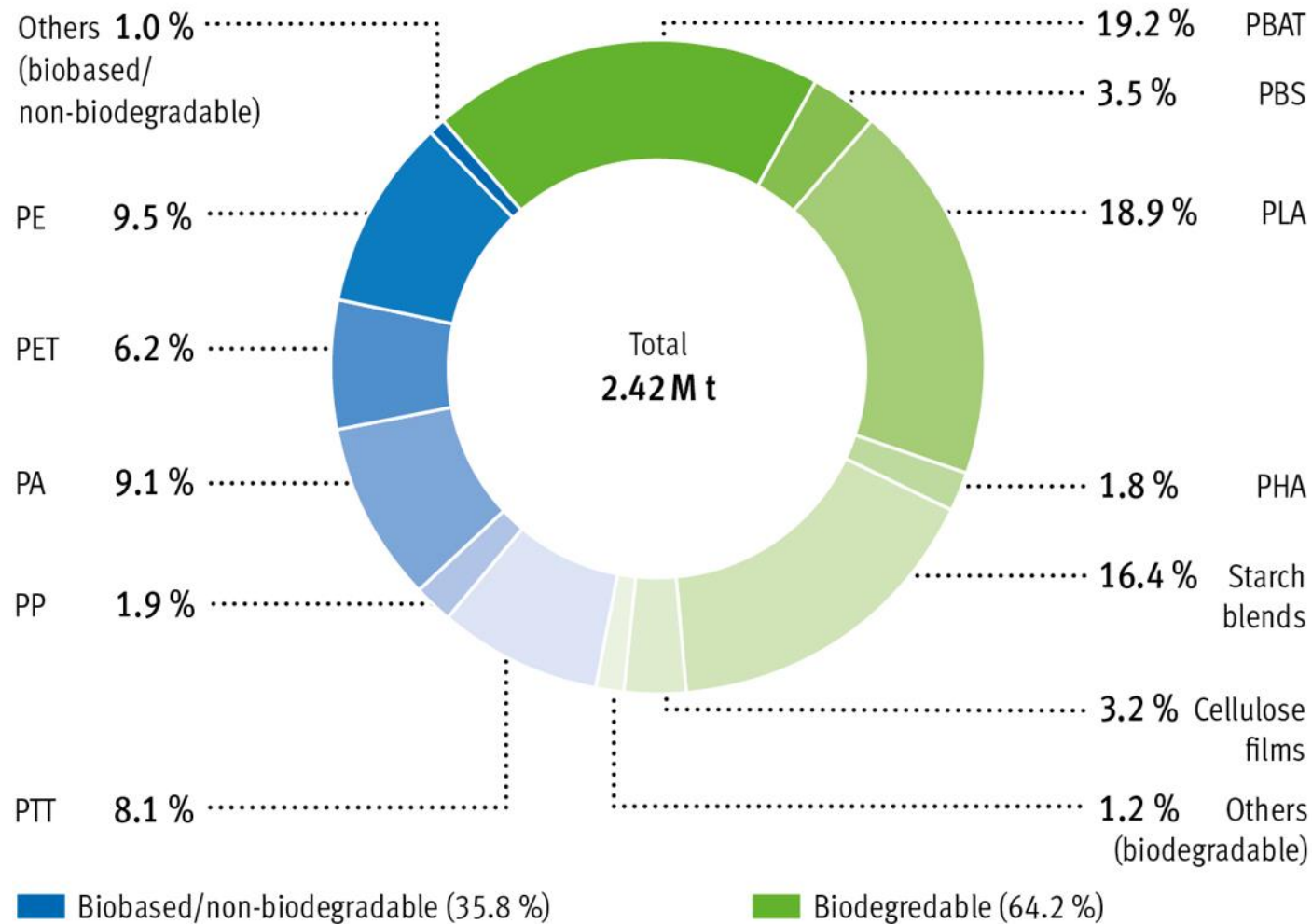
Global production capacity of bioplastics



Quelle: european bioplastics, nova-Institut
Task 42
Biorefining in a circular economy

© FNR 2020

Market share of various bioplastics in 2021



Source: european bioplastics, nova-Institut (2021)
© FNR 2022

Task 42
Biorefining in a circular economy



Success stories



30.05.2023

Algae biotechnology: creating profitable processes

Fraunhofer researchers from Stuttgart and Leuna have investigated how valuable ingredients can be obtained in high yield from diatoms.

→ [Read more](#)



12.10.2022

Recycling rare earths with peptides

In the PepTight project, researchers want to identify peptides that are able to filter special rare earths, known as lanthanides, from industrial water.

→ [Read more](#)



22.05.2023

Producing basic chemicals with wood and hot steam

Researchers have further developed the process of torrefaction to improve the material and energy recovery of plant biomass.

→ [Read more](#)

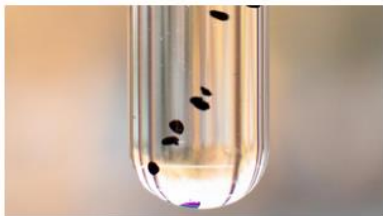


21.09.2022

Thermoformable paper as a plastic substitute

Paper has a better recycling cycle than plastics. Researchers therefore want to develop a new paper-based packaging material.

→ [Read more](#)



19.12.2022

Heading for the new biotechnology?

Researchers want to replace the substrates sugar and alcohol with cheaper and sustainable hydrogen.

→ [Read more](#)



01.09.2022

Not everyone wants the bioeconomic transformation

A research project examines mentalities, their backgrounds and consequences regarding the ecological-social transformation.

→ [Read more](#)

<https://biooekonomie.de/en/funding/success-stories>

Thuenen Institute of Agricultural Technology
Heinz Stichnothe
Heinz.stichnothe@thuenen.de



IEA Bioenergy

Technology Collaboration Programme

Task 42

Biorefining in a circular economy

www.ieabioenergy.com
<http://task42.ieabioenergy.com>