Om efterspørgsel på biobaseret plast

Rasmus Grusgaard
Plastindustrien i Danmark

PLAST INDUSTRIEN
Brancheforening for danske plastvirksomheder

Plastindustrien i Danmark

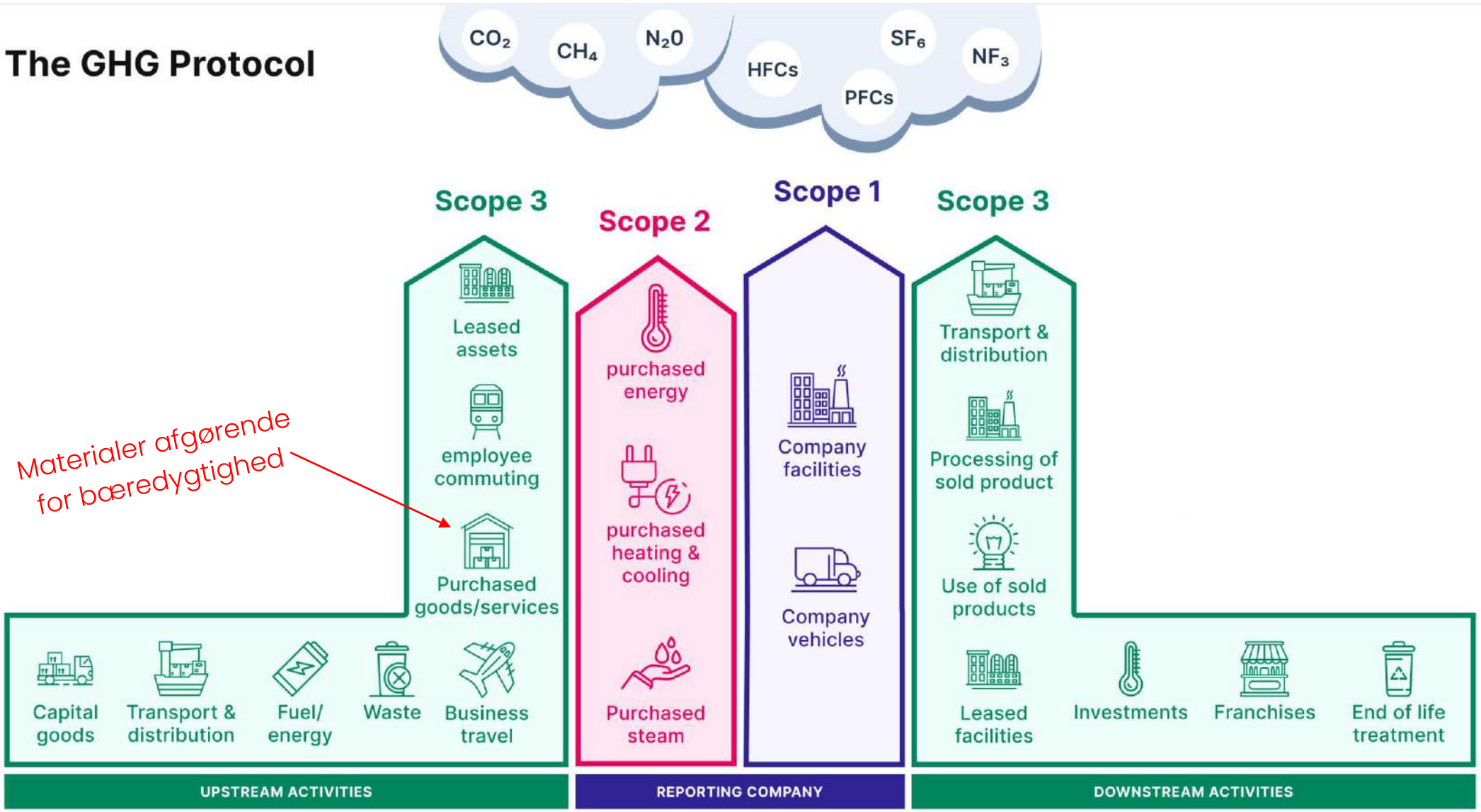
Brancheforening for knap 300 plastvirksomheder
+20.000 medarbejdere
Hele værdikæden: **Råvarer → Producenter → Genanvendere**
Industriens Hus, tæt på DI men ikke det samme

PLAST
INDUSTRIEN

Umættelig efterspørgsel på bæredygtighed i plastindustrien

PLAST
INDUSTRIEN

The GHG Protocol



PLAST INDUSTRIEN

Tre veje til bæredygtighed

→Genanvendt plast

→ PtX

→ Fornybare råvarer

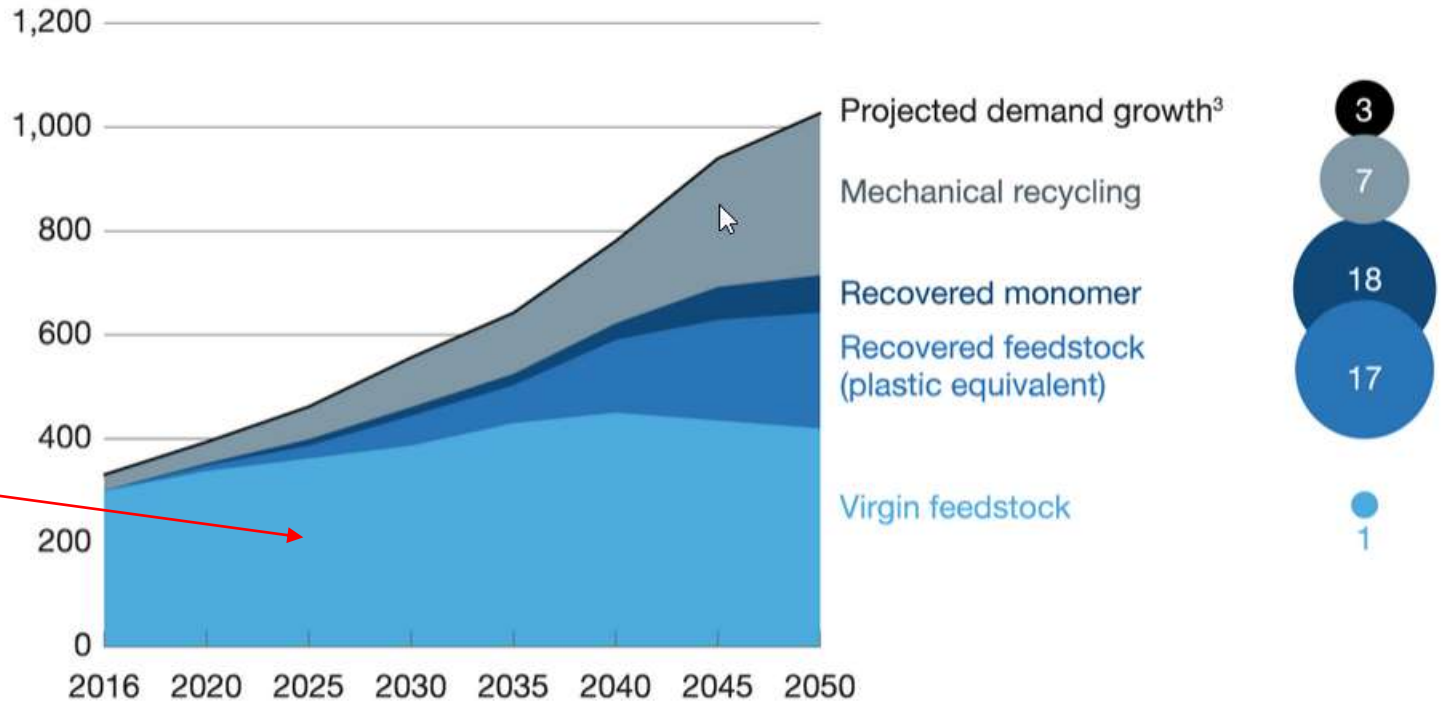
PLAST
INDUSTRIEN

→ Genanvendt plast

McKinsey & Company

By 2050, nearly 60 percent of plastics production could be based on plastics reuse and recycling.

Global polymer demand 2016–50 and how it could be covered, millions of metric tons[1]



Vækst i plastforbrug sker ikke i virgin plast

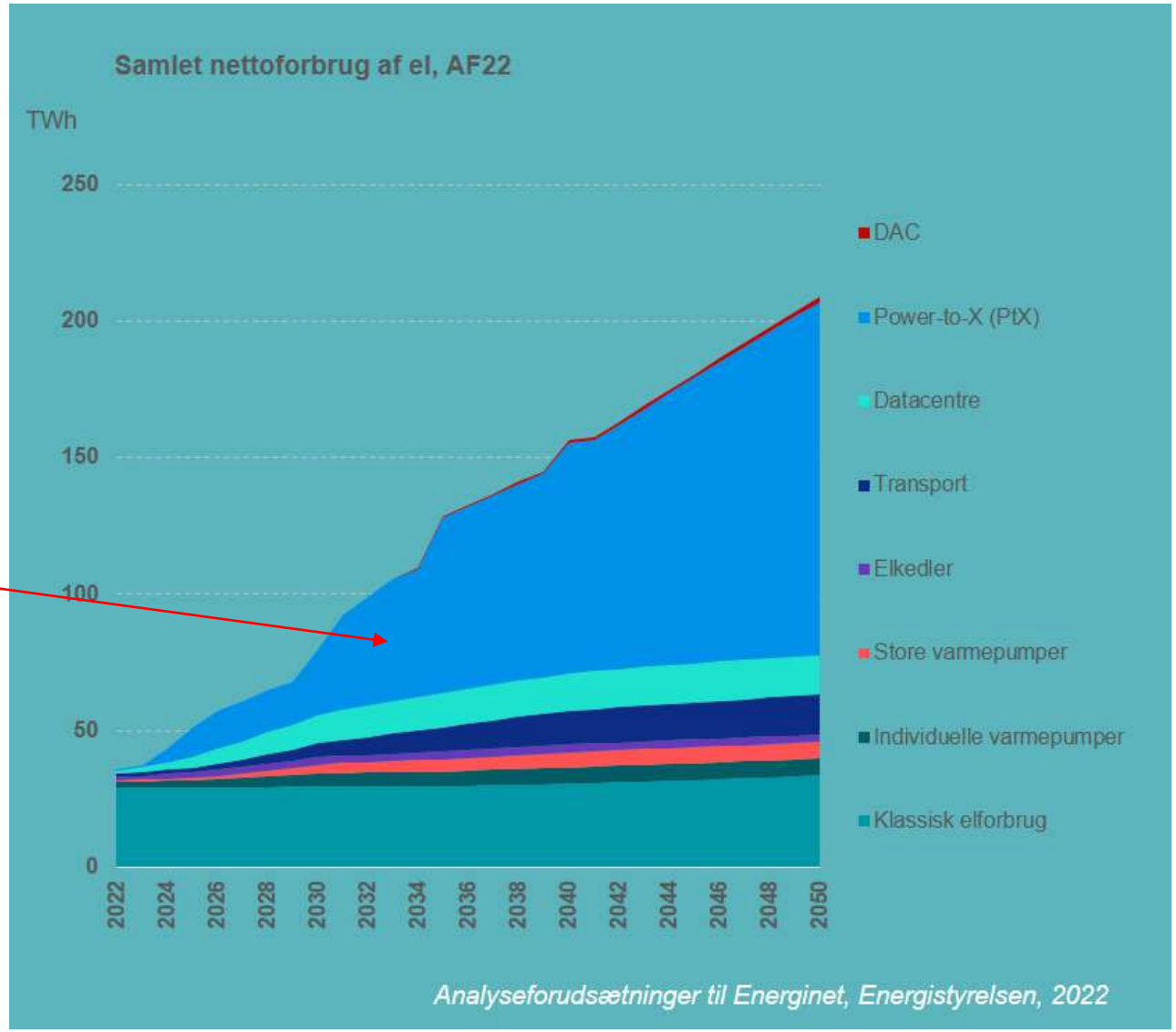
[1]Scenario based on a multi-stakeholder push to boost recycling, regulatory measures to encourage recycling, consistent progress on technologies, and $75-per-barrel oil price.
[2]Compound annual growth rate. Mechanical recycling limited by downcycling and applicable materials, monomerization limited by applicability to condensation polymers only, pyrolysis limited by likely rise in input costs.
[3]After demand reduction, assuming annual global GDP growth of 3.1%.

PLAST INDUSTRIEN

→ PtX
(el + vand + luft)

Søren Lyng Ebbehøj
Chefkonsulent, ph.d.

Fremstilling af bl.a. brændstoffer og materialer meget stor del af fremtidens elforbrug



PLAST INDUSTRIEN

ANDRE SKRIVER

Lego, Novo Nordisk og European Energy i samarbejde om grøn plastik

Energi | Via Berlingske | 20. april kl. 10:08

Illustration: Casper Dalhoff.

BØRSEN

BÆREDYGTIG

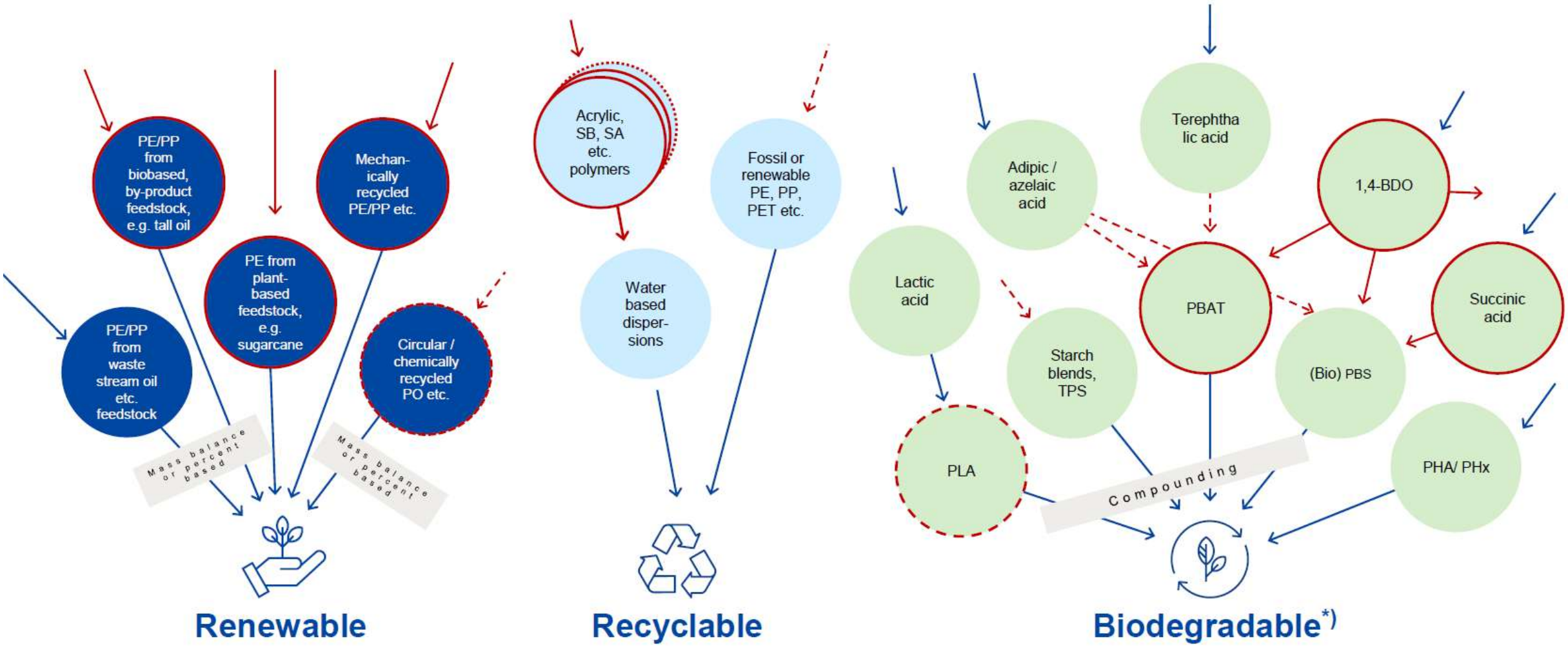
Sønderjysk fabrik melder udsolgt: Mærsk, Lego, Novo og Circle K har købt det hele

Byggeriet af Kassø-anlægget, som det ser ud på European Energys live cam lige nu. Foto: European Energy


MAERSK
ALL THE WAY TO ZERO
MAERSK

→ Fornybare råvarer

Sustainable plastics supply overview



Supply ok | Potential / past short supply | Short supply | *) *Increasingly biobased*

walki

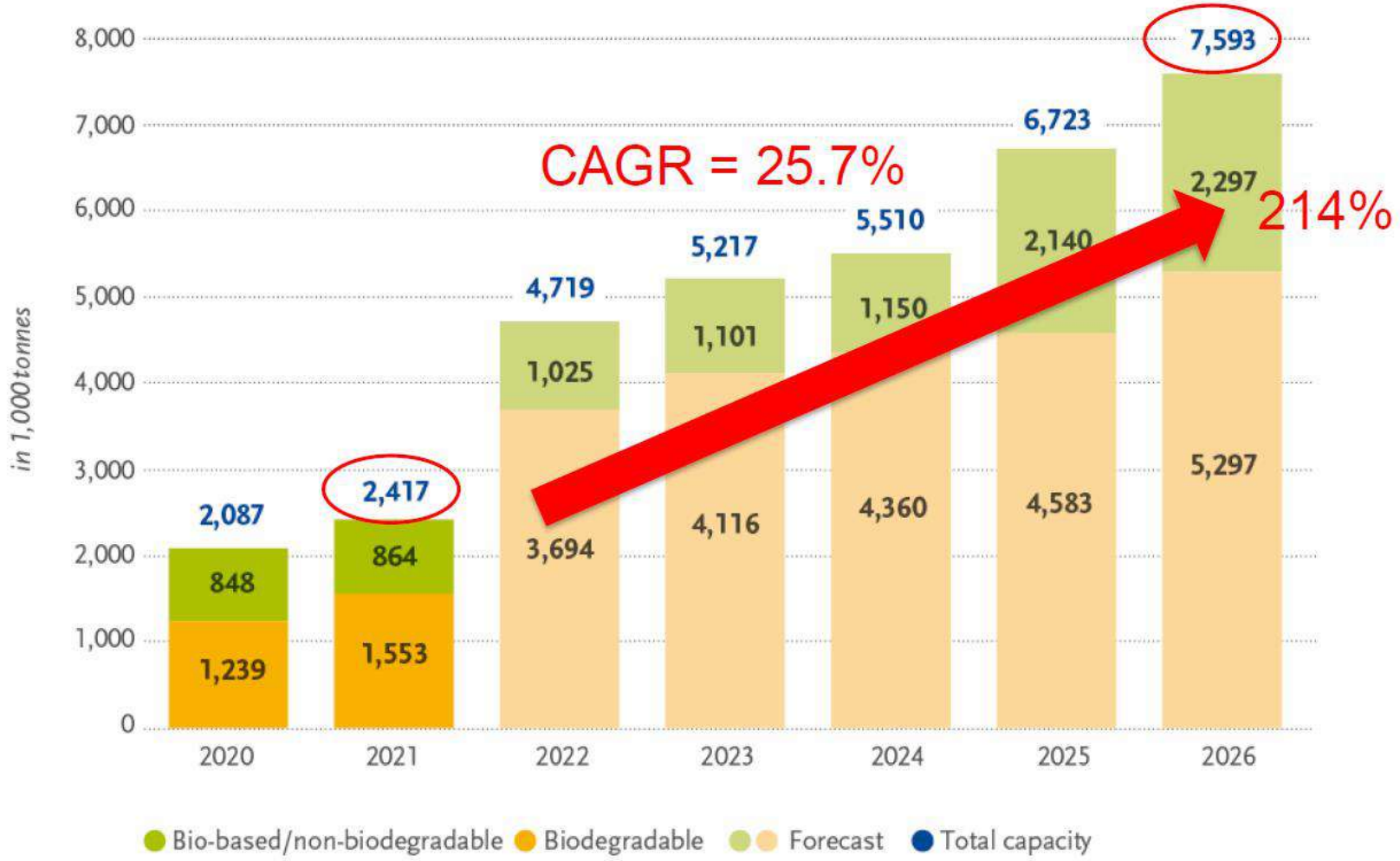
New-bio

Nye plasttyper
Kan kun laves af biologisk råvare
Nye produktioner

PLAST
INDUSTRIEN

- **Stivelse**: Udvundet fra afgrøder som majs, kartofler og hvede, kan stivelse omdannes til bioplast som polylactid (PLA).
- **Sukker**: Sukker, opnået fra sukkerrør, sukkerroer og andre planter, kan fermenteres for at producere bio-baserede monomerer, som derefter kan polymeriseres for at danne plastik.
- **Vegetabilske olier**: Olier fra planter som sojabønner, ricinus og palme kan bruges til at producere bio-baseret polyethylen (bio-PE) og polypropylen (bio-PP).
- **Cellulose**: Kilde fra træ og visse landbrugsrester kan cellulose bruges til at producere cellulosebaseret plastik.
- **Proteiner**: Proteiner fra kilder som soja, hvede og kasein kan bruges til at producere bionedbrydelig plastik.
- **Lignin**: Et biprodukt fra papir- og papirindustrien kan lignin anvendes som råmateriale til visse bioplastikker.
- **Alger**: Algebiomasse kan behandles for at ekstrahere olier og andre komponenter, der kan bruges til at producere bioplastik.
- **Mikrobiel fermentering**: Bestemte mikroorganismer kan producere polymerer som polyhydroxyalkanoater (PHA), som kan ekstraheres og bruges som bioplastik.

Global production of bioplastics



Bio-derived

Velkendte plasttyper med biokulstof
Omstilling af eksisterende produktioner

PLAST
INDUSTRIEN

Verbund site Ludwigshafen

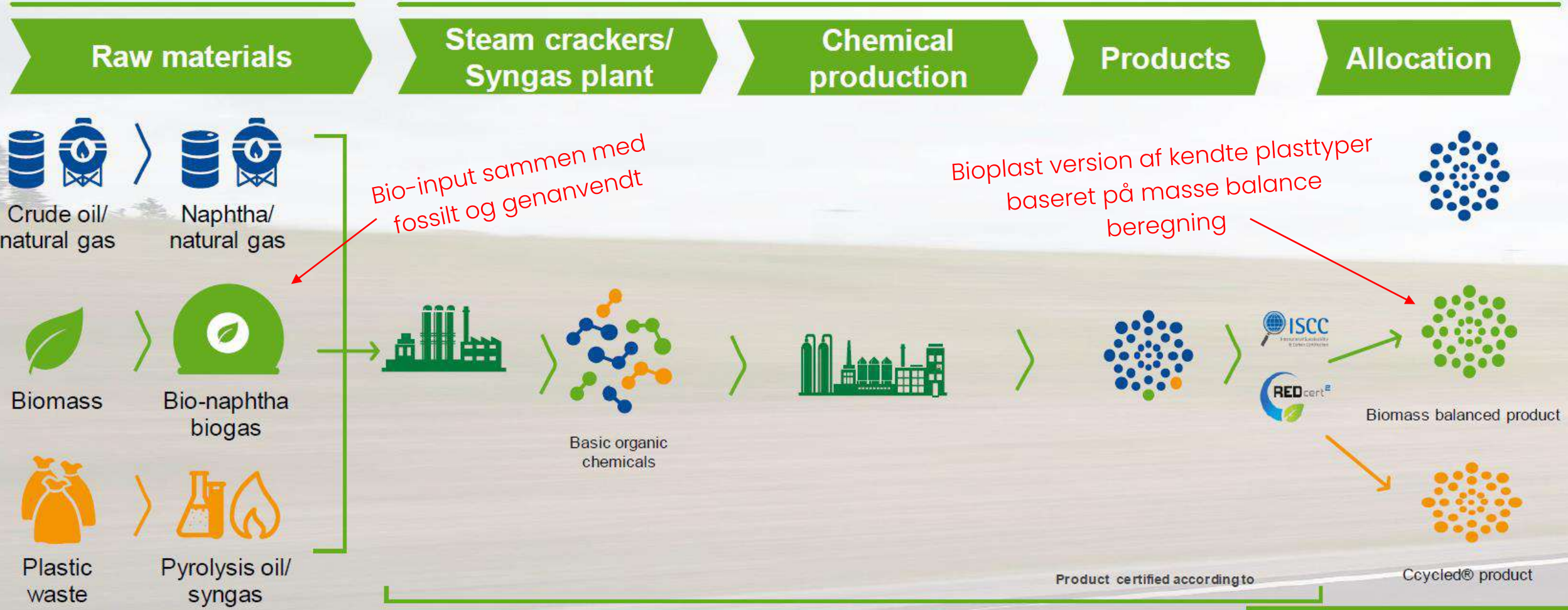
The world's largest integrated chemical complex owned by a single company.

Headquarter	
Employees BASF SE	34.705*
Site area	10 km²
Sales products	~ 8.1 million metric tons p.a.**
Road	~ 106 km
Rail	~ 230 km
Logistics	
	~ 1,900 trucks daily
	~ 400 railcars daily
	~ 15 ships daily
Pipeline system	~ 2,850 km
Production facilities	~125 production facilities with 200 production plants

* As of December 31, 2022
** From in-house production

PLAST INDUSTRIEN

Mass balance in a complex value chain
BASF present



BASF
We create chemistry

Pointer:

- stort behov for plast
- én løsning kan ikke stå alene
- pris spiller en rolle
- kemiindustri er driver

Bioplastic Conference 11. April 2024

https://plast.dk/2023/04/praesentationer-og-billeder-fra-nordic-bioplastic-conference-2023/

PLAST INDUSTRIEN

Markedsdata på Bioplast

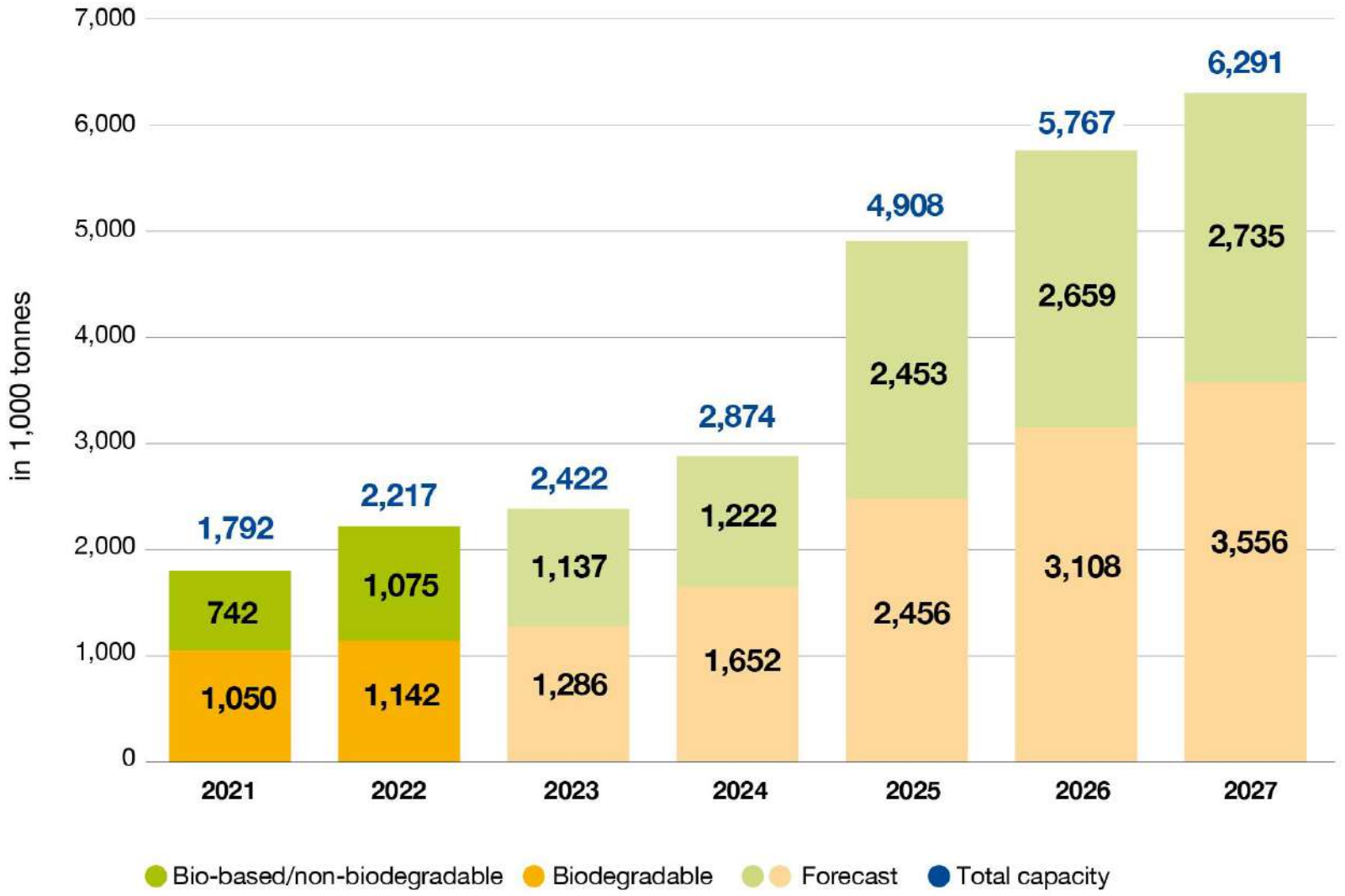
2021 – 2027

European Bioplastics

www.european-bioplastics.org

PLAST
INDUSTRIEN

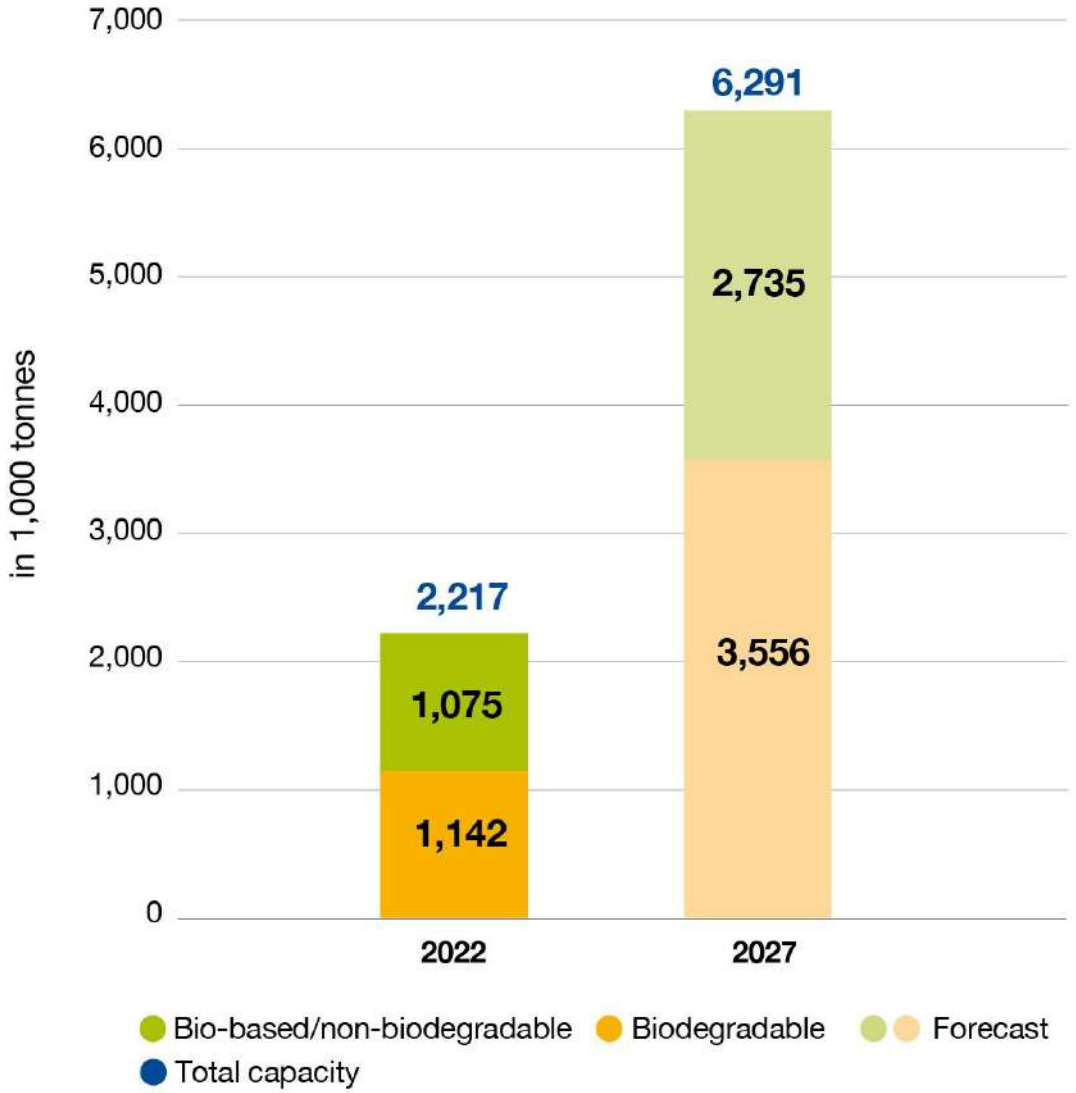
Global production capacities of bioplastics 2021 – 2027



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

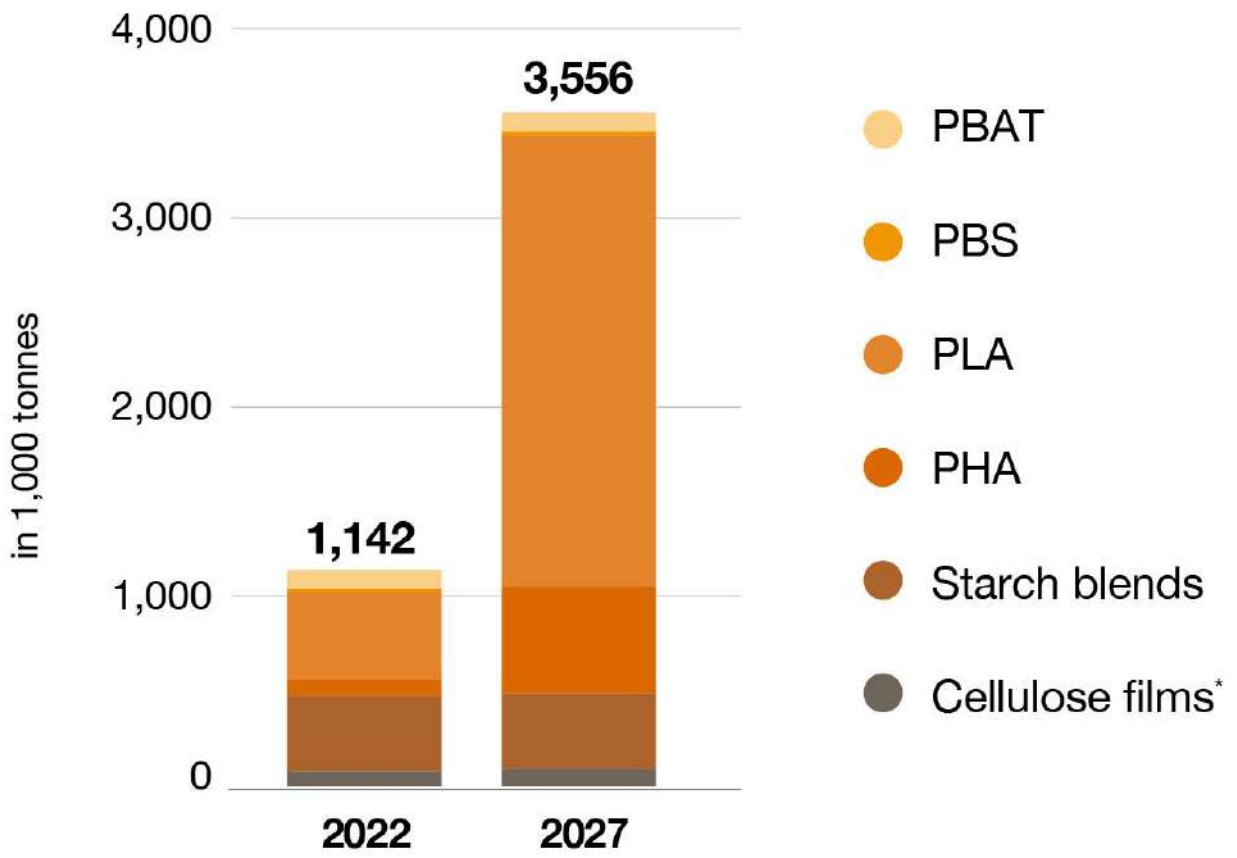
Global production capacities of bioplastics 2022 vs. 2027



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

Biodegradable bioplastics 2022 vs. 2027

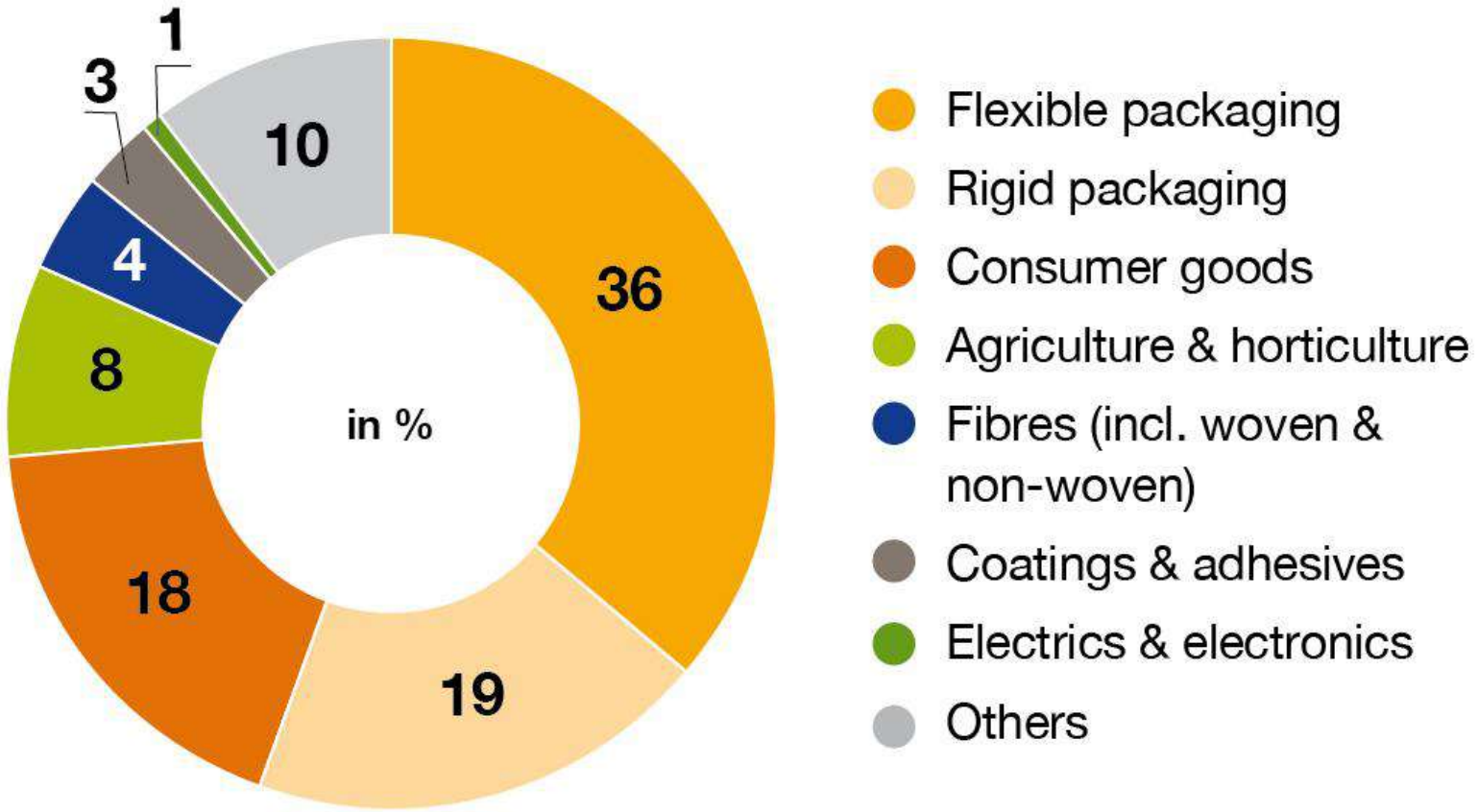


Source: European Bioplastics, nova-Institute (2022)

*Regenerated cellulose films

PLAST INDUSTRIEN

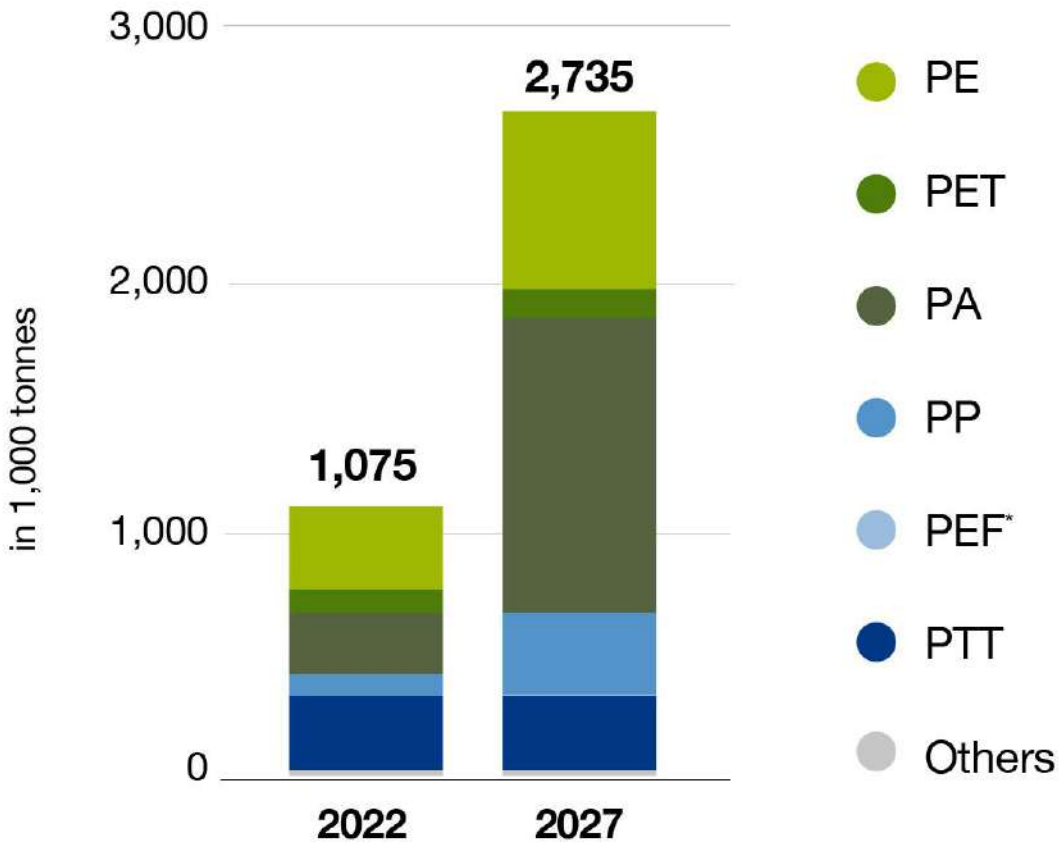
Biodegradable bioplastics 2022 by market segment



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

Biobased and durable bioplastics 2022 vs. 2027

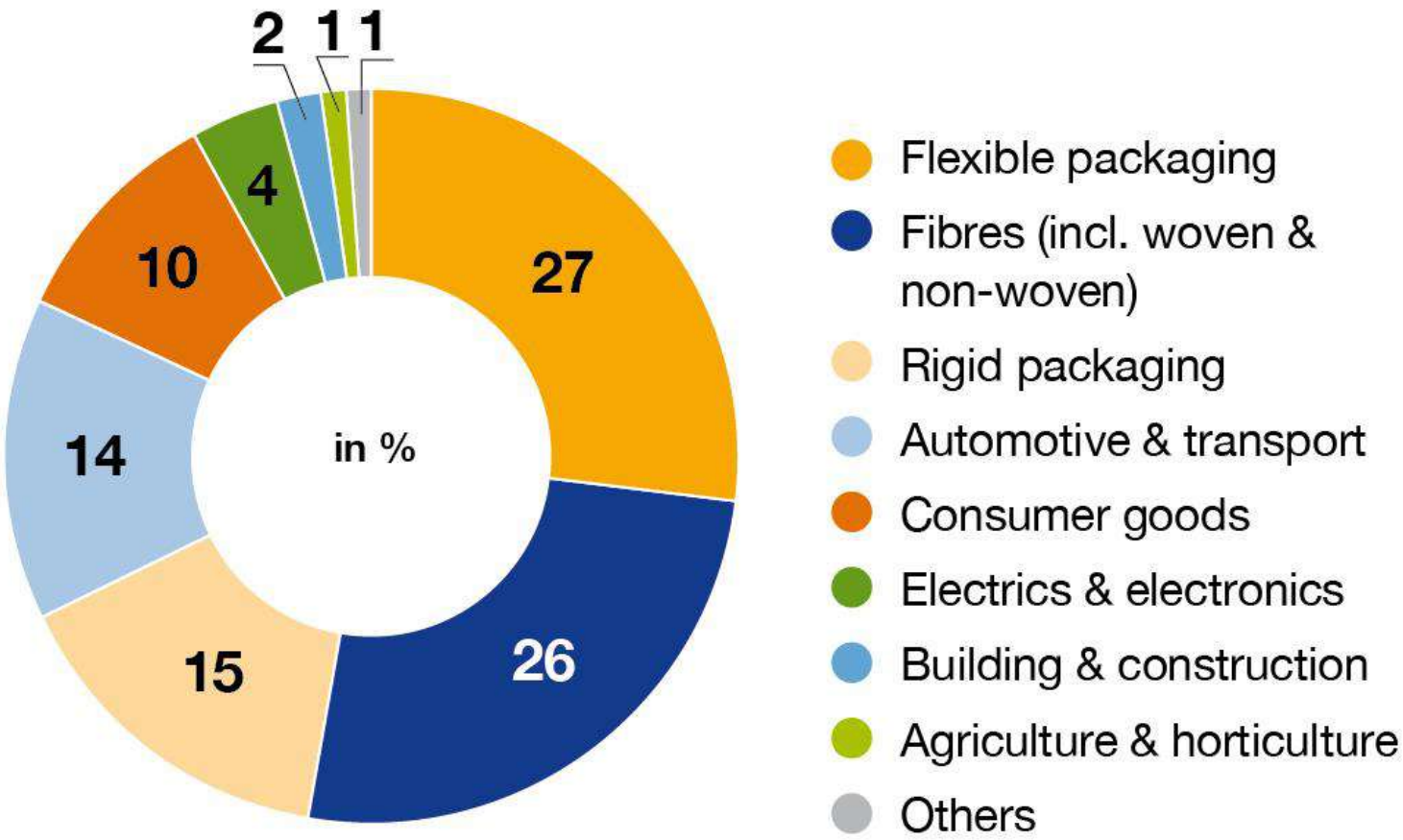


Source: European Bioplastics, nova-Institute (2022)

*PEF is currently in development and predicted to be available in commercial scale in 2023

PLAST INDUSTRIEN

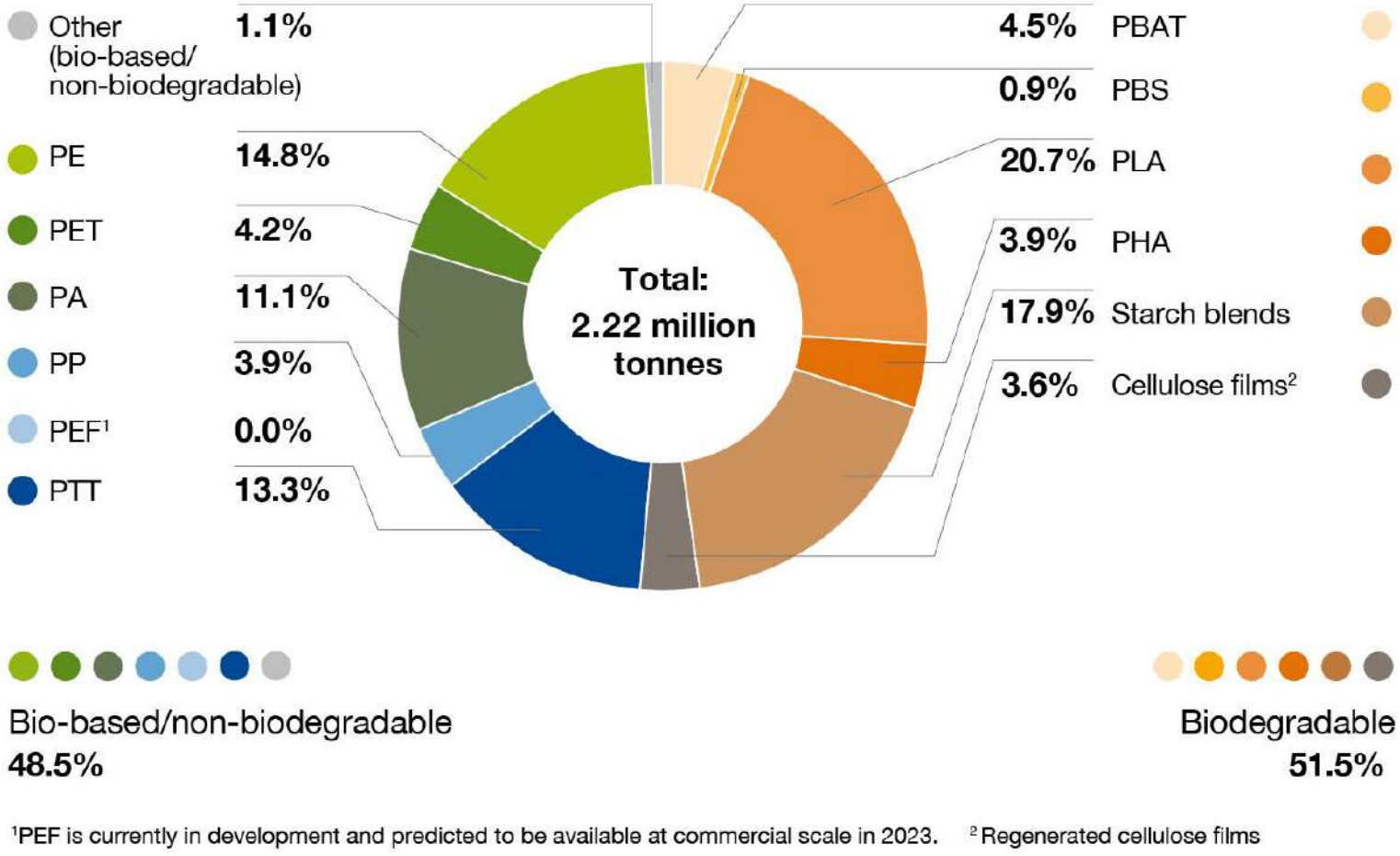
Biobased and durable bioplastics 2022 by market segment



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

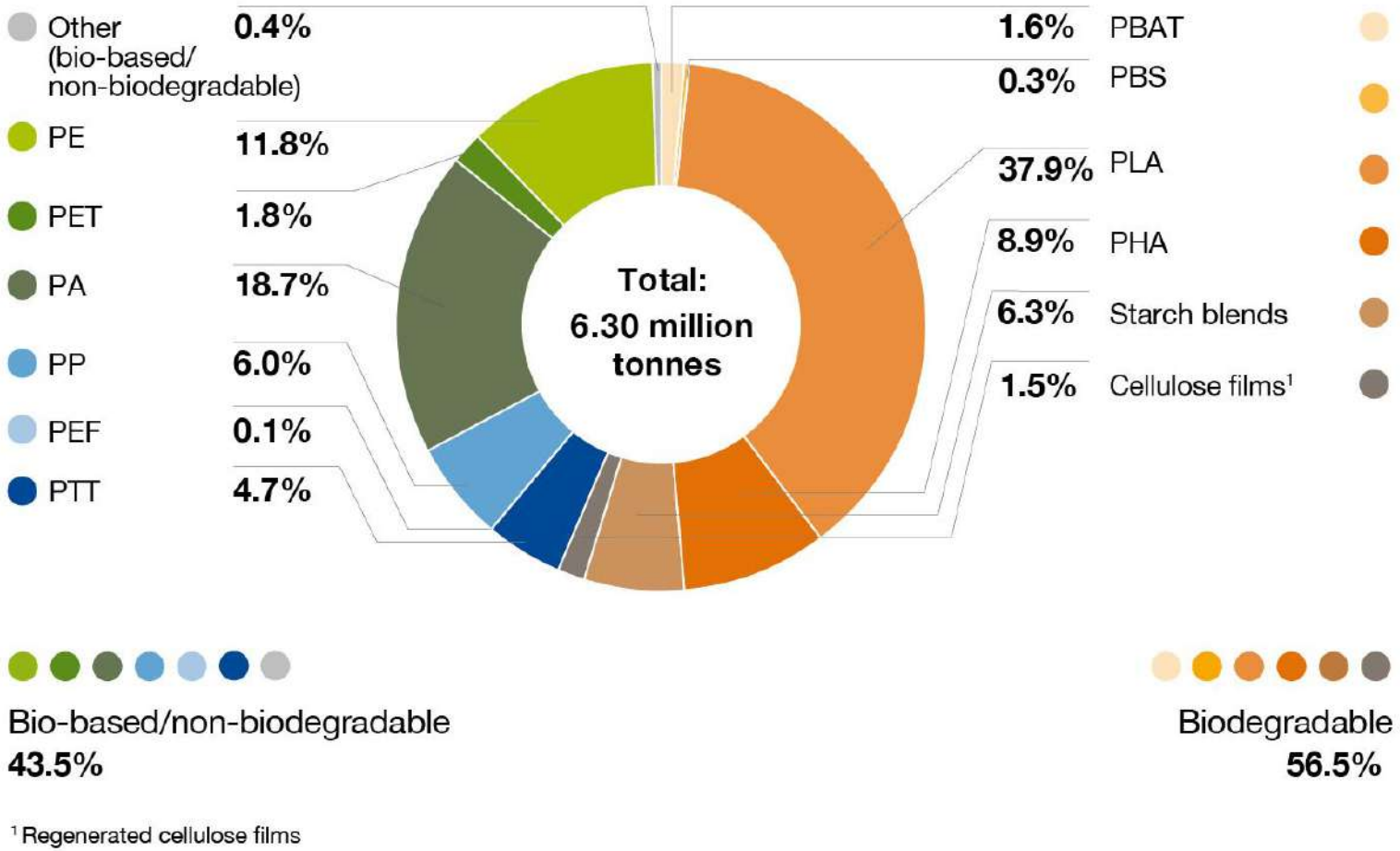
Global production capacities of bioplastics 2022 by material type



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

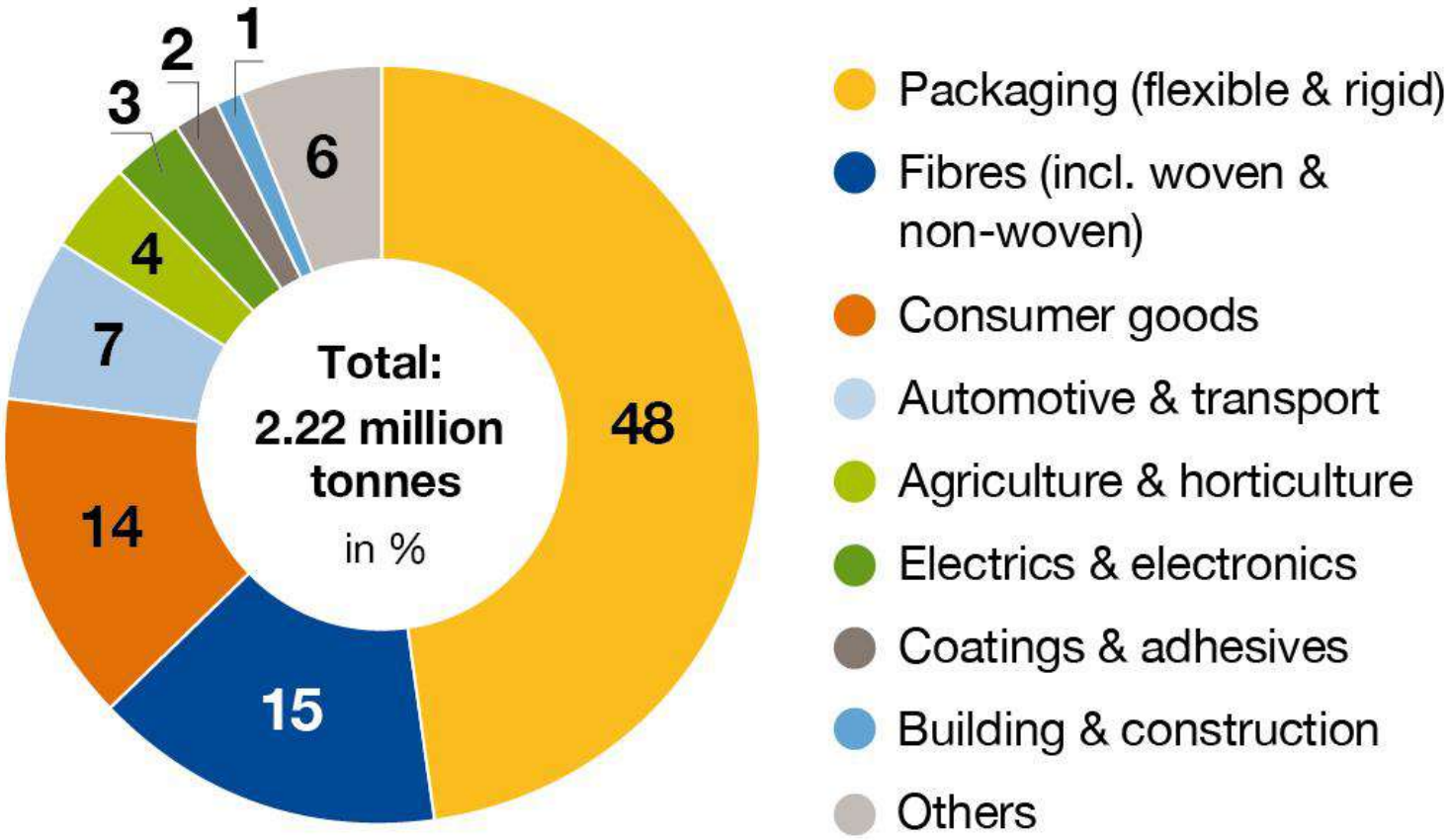
Global production capacities of bioplastics 2027 by material type



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

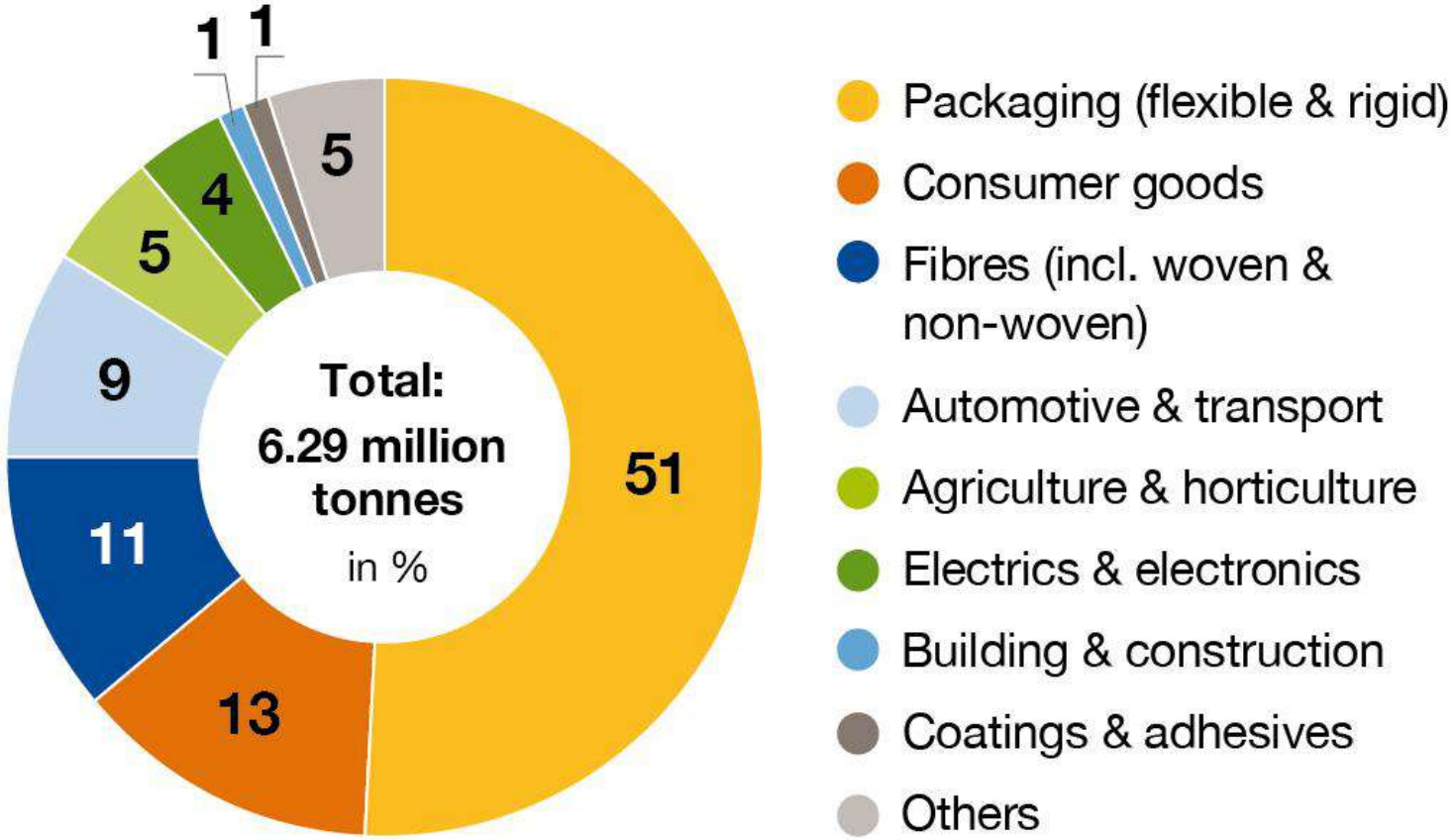
Global production capacities of bioplastics 2022 by market segment



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

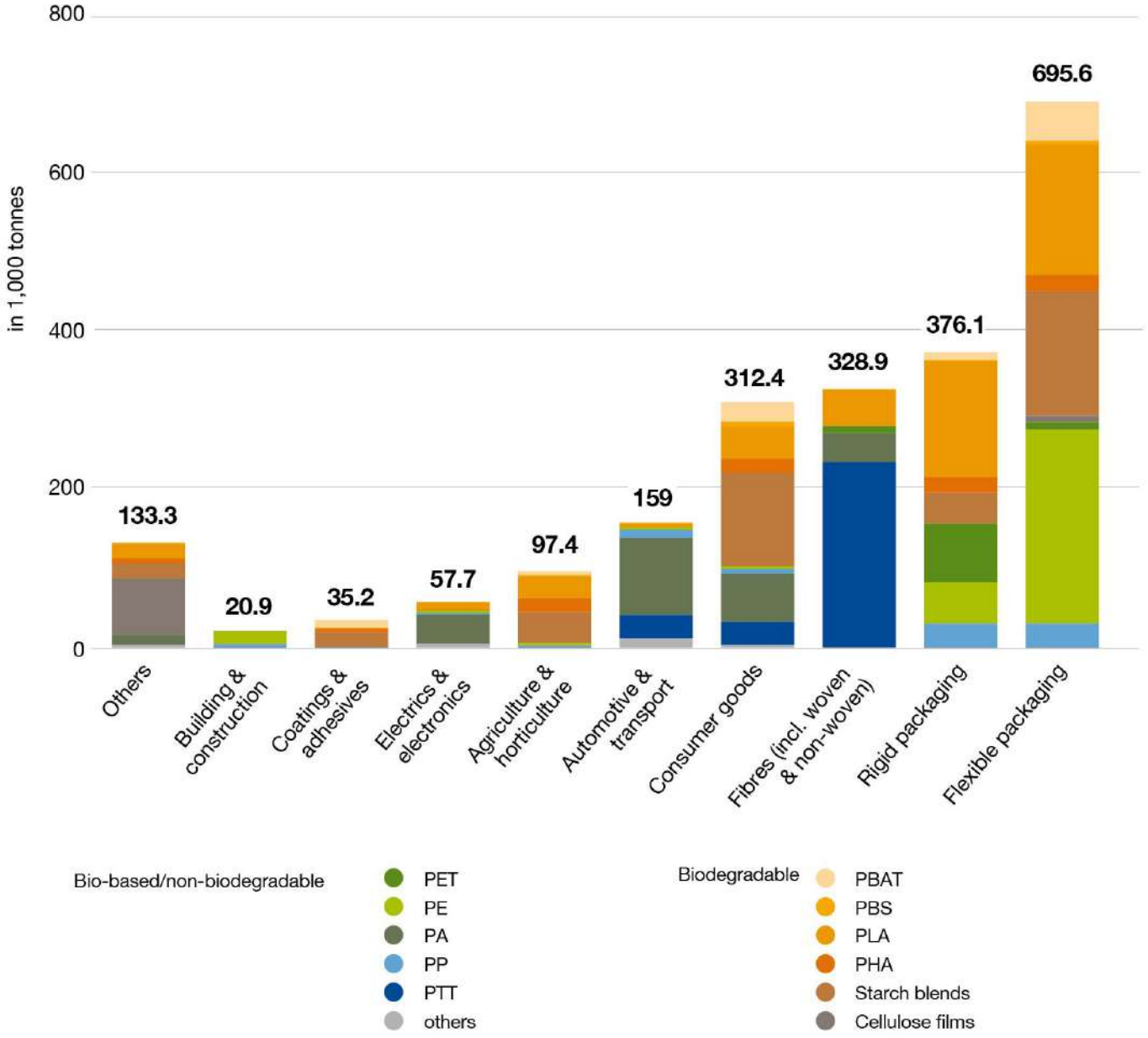
Global production capacities of bioplastics 2027 by market segment



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

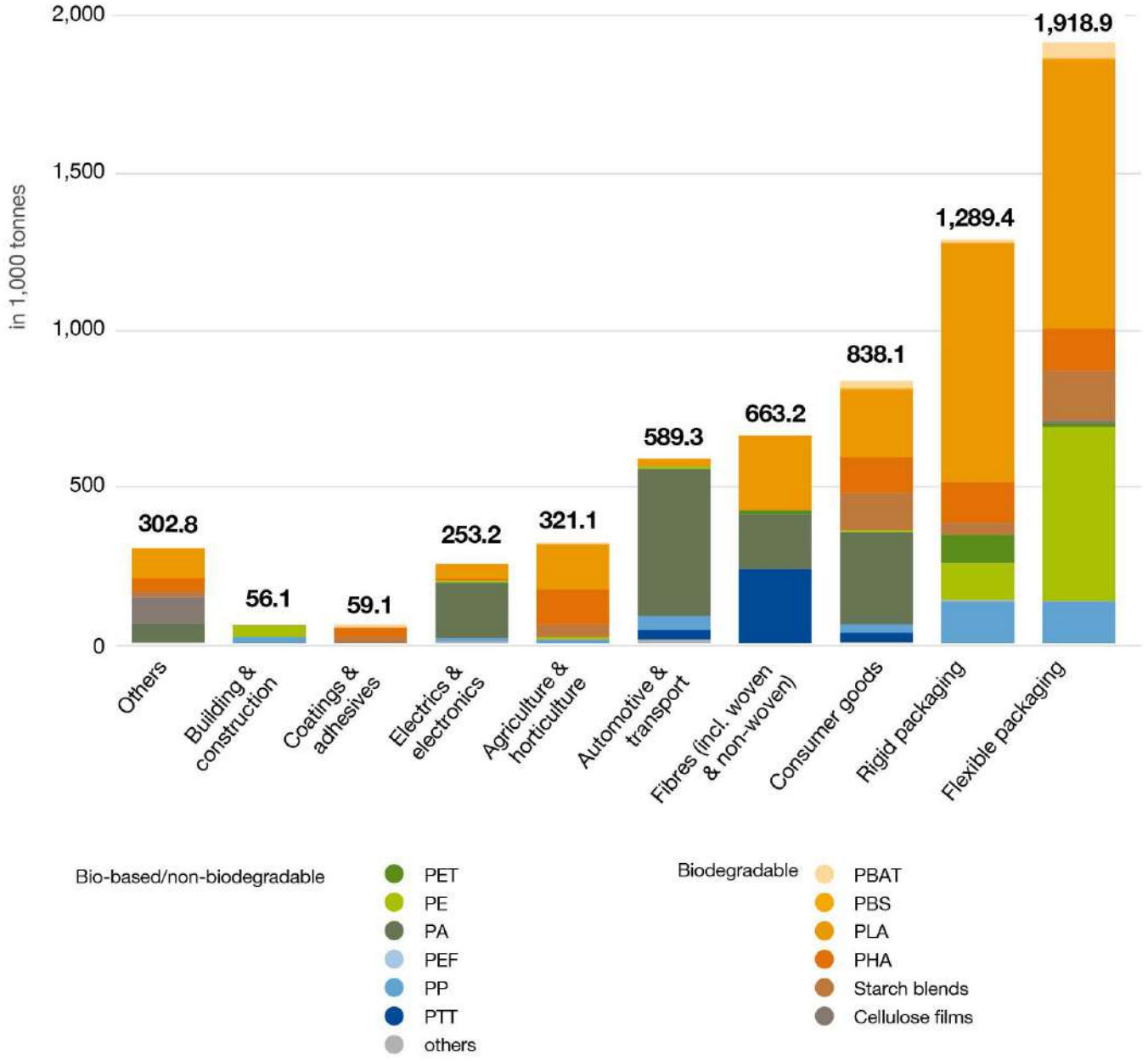
Global production capacities of bioplastics 2022 by market segment



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

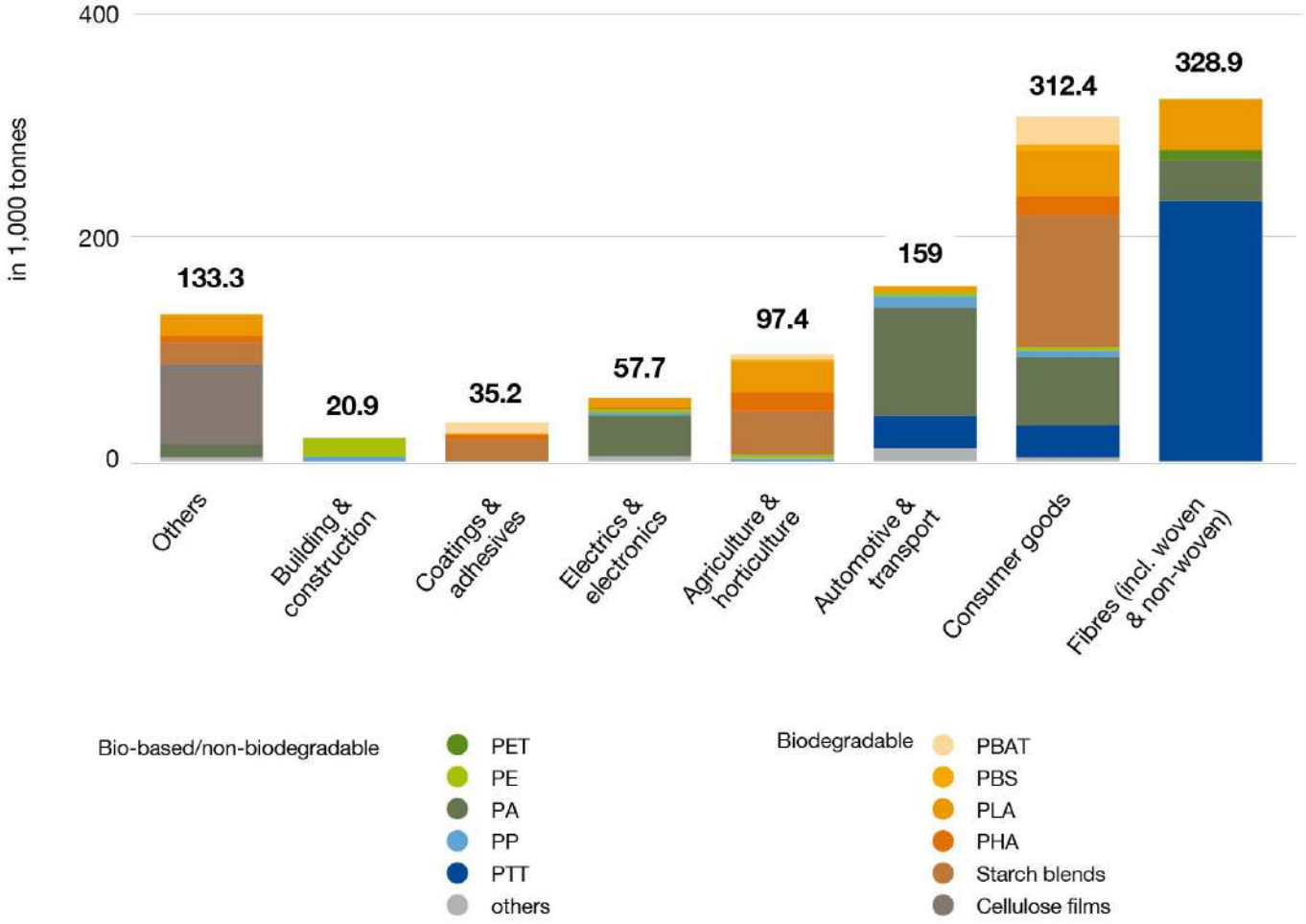
Global production capacities of bioplastics 2027 by market segment



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

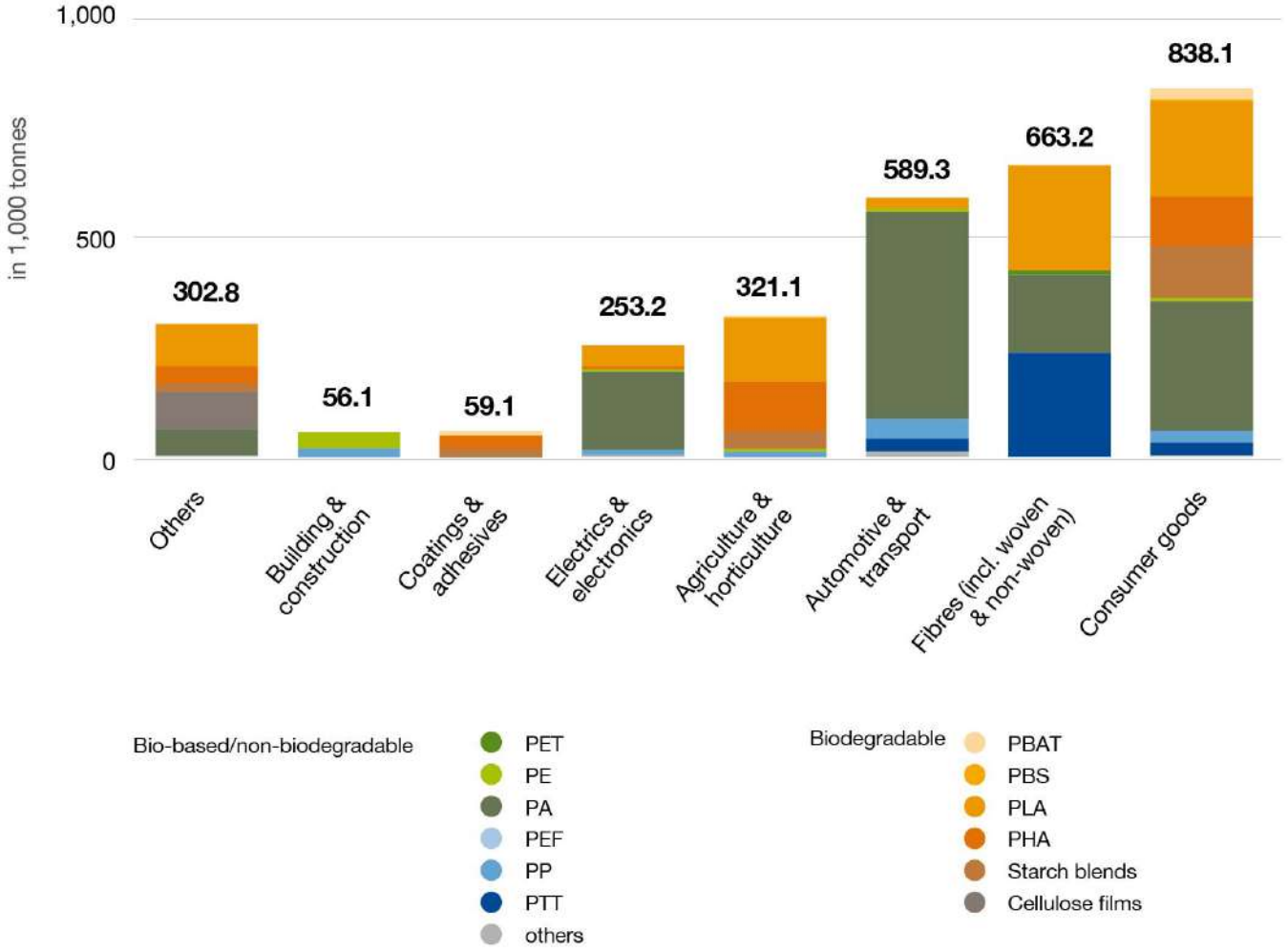
Global production capacities of bioplastics 2022
by market segment without packaging



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

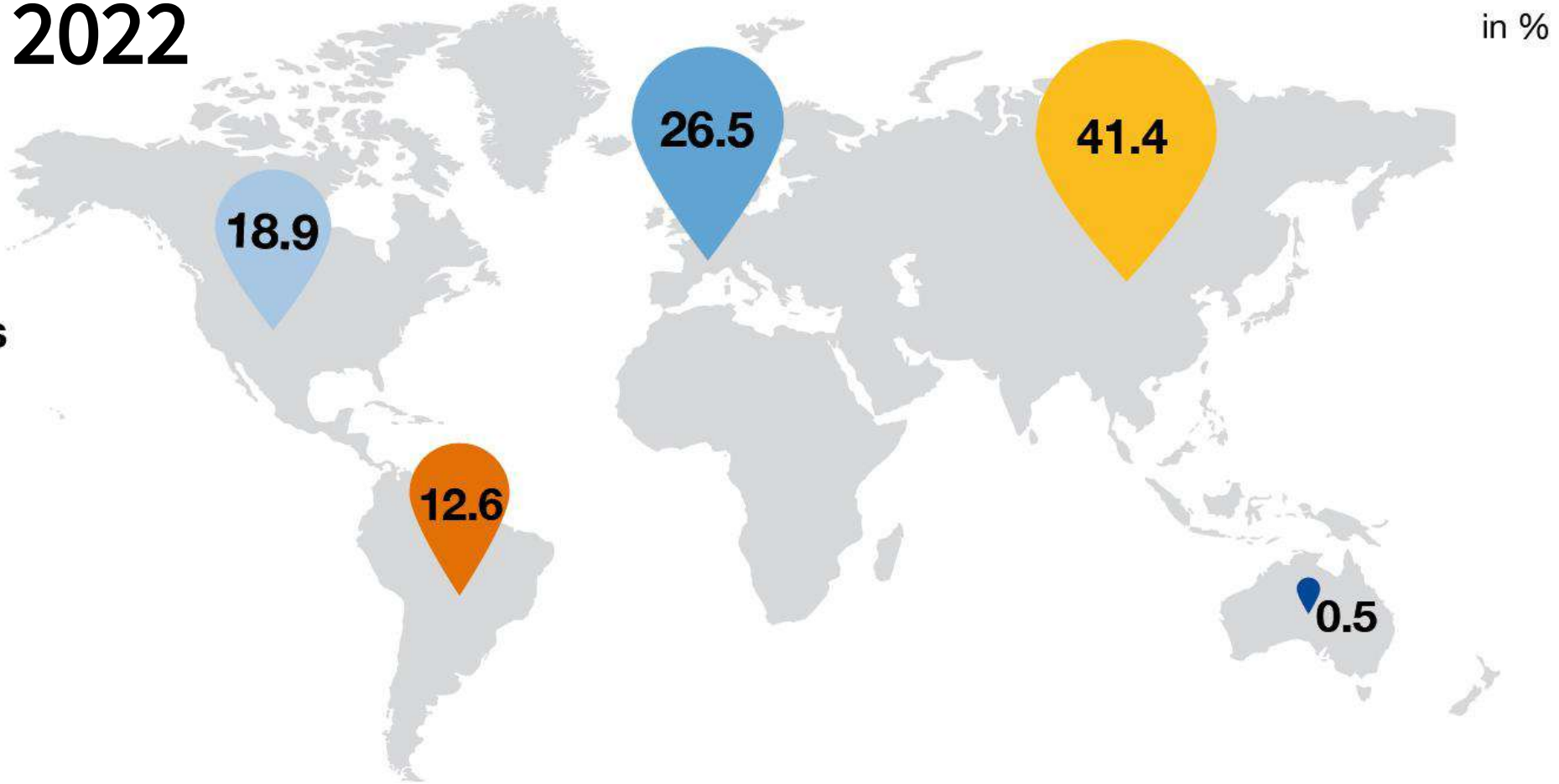
Global production capacities of bioplastics 2027
by market segment without packaging



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

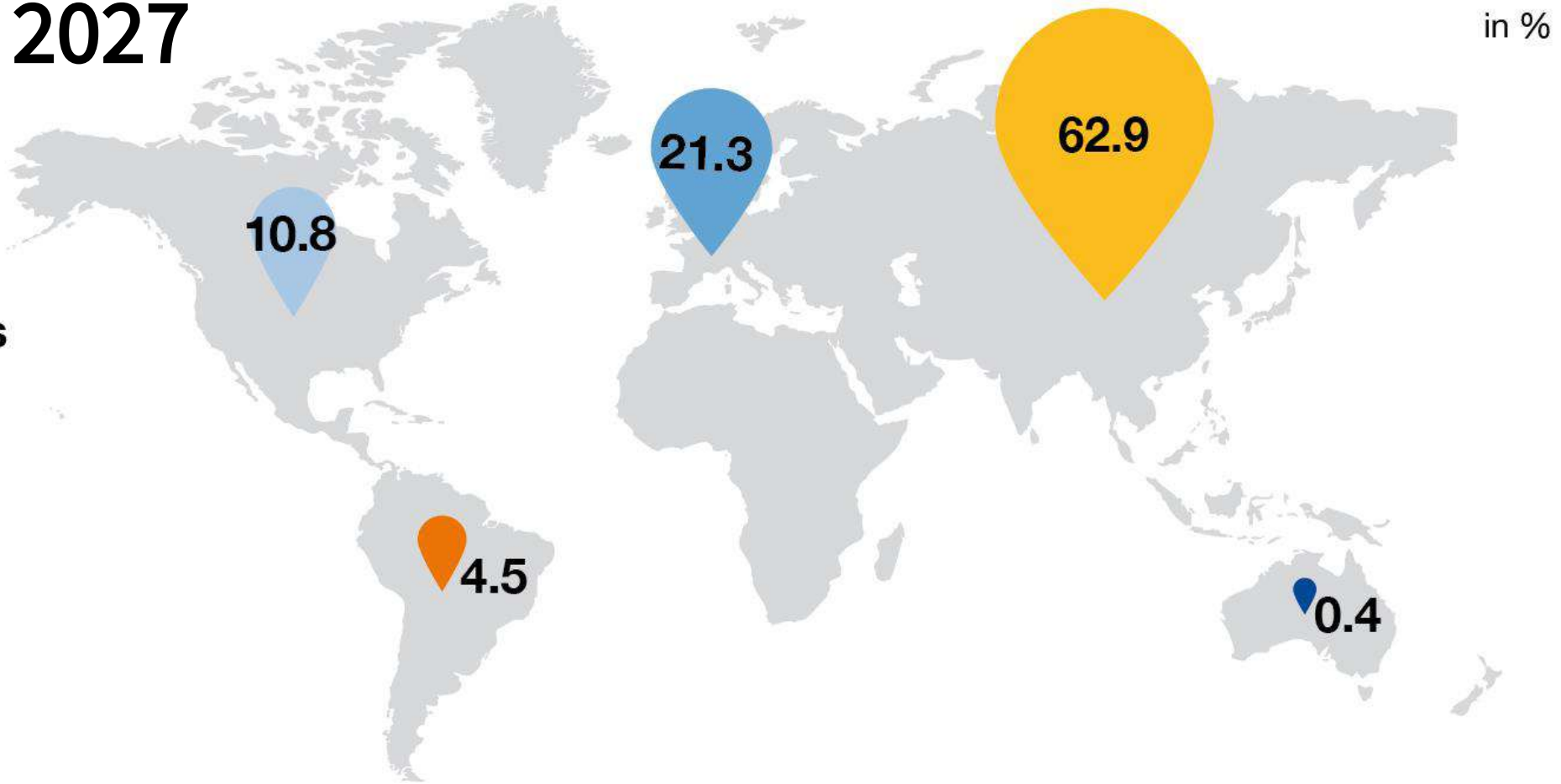
Global production capacities of bioplastics 2022



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

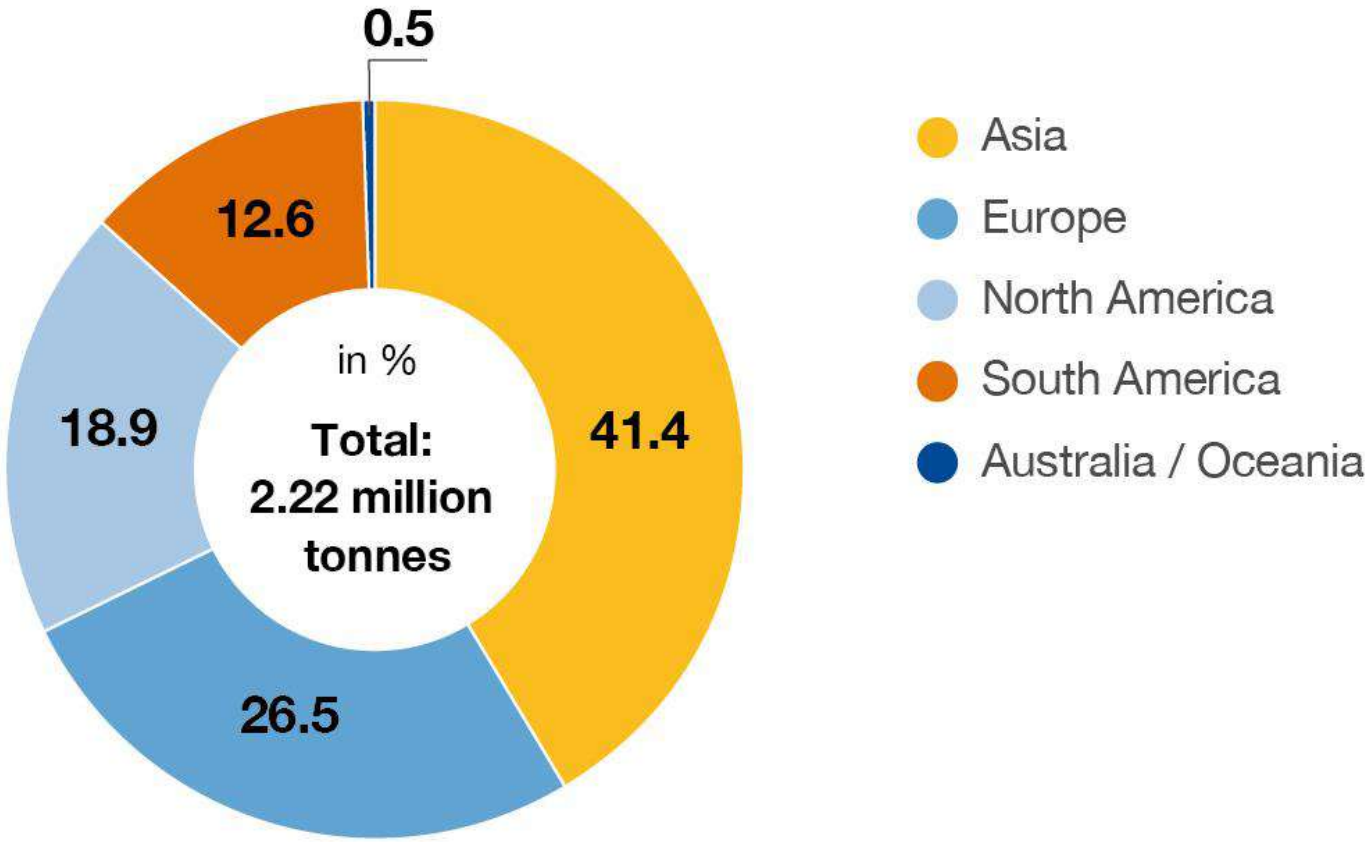
Global production capacities of bioplastics 2027



Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

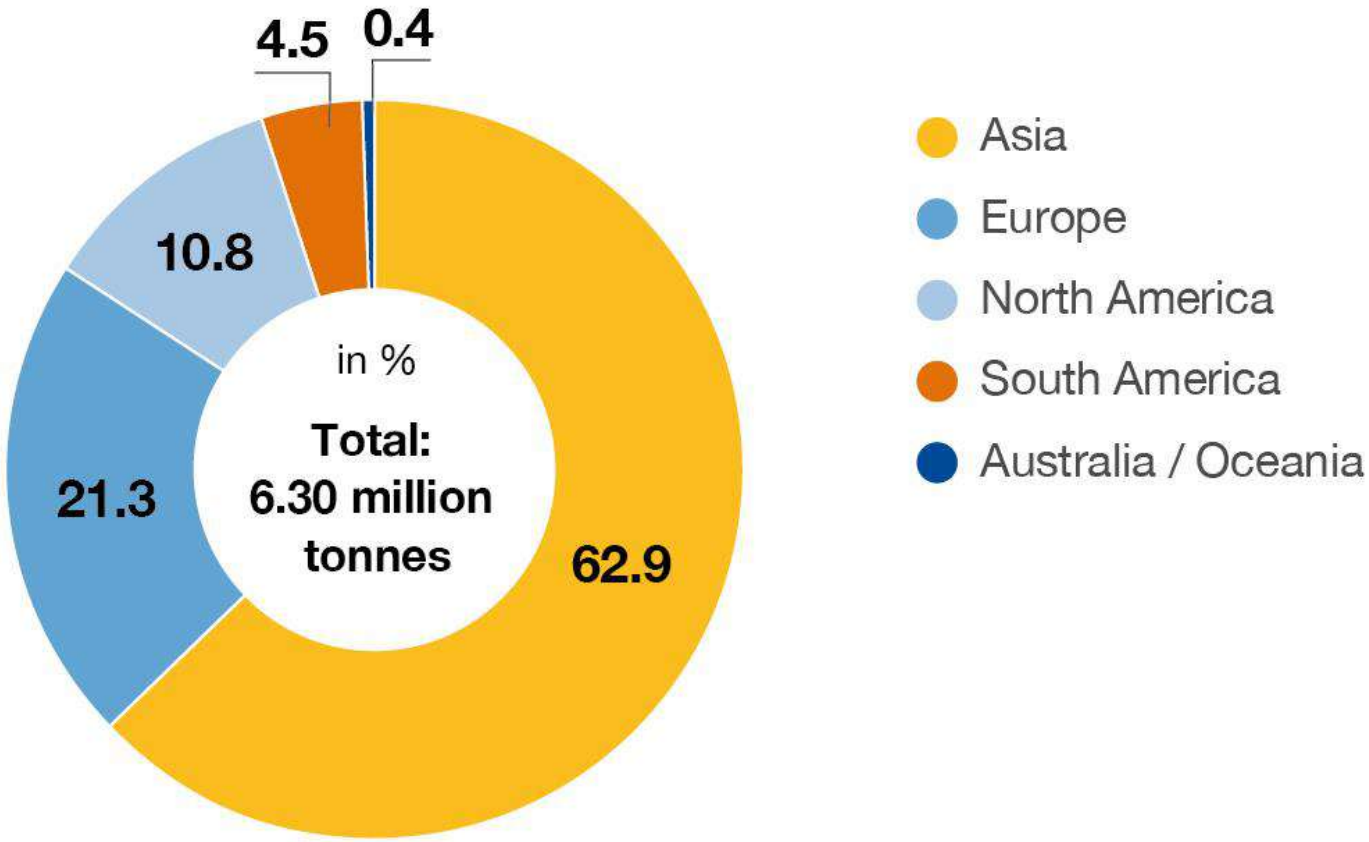
Global production capacities of bioplastics 2022 by region



Source: European Bioplastics, nova-Institute (2022)

PLAST
INDUSTRIEN

Global production capacities of bioplastics 2027 by region

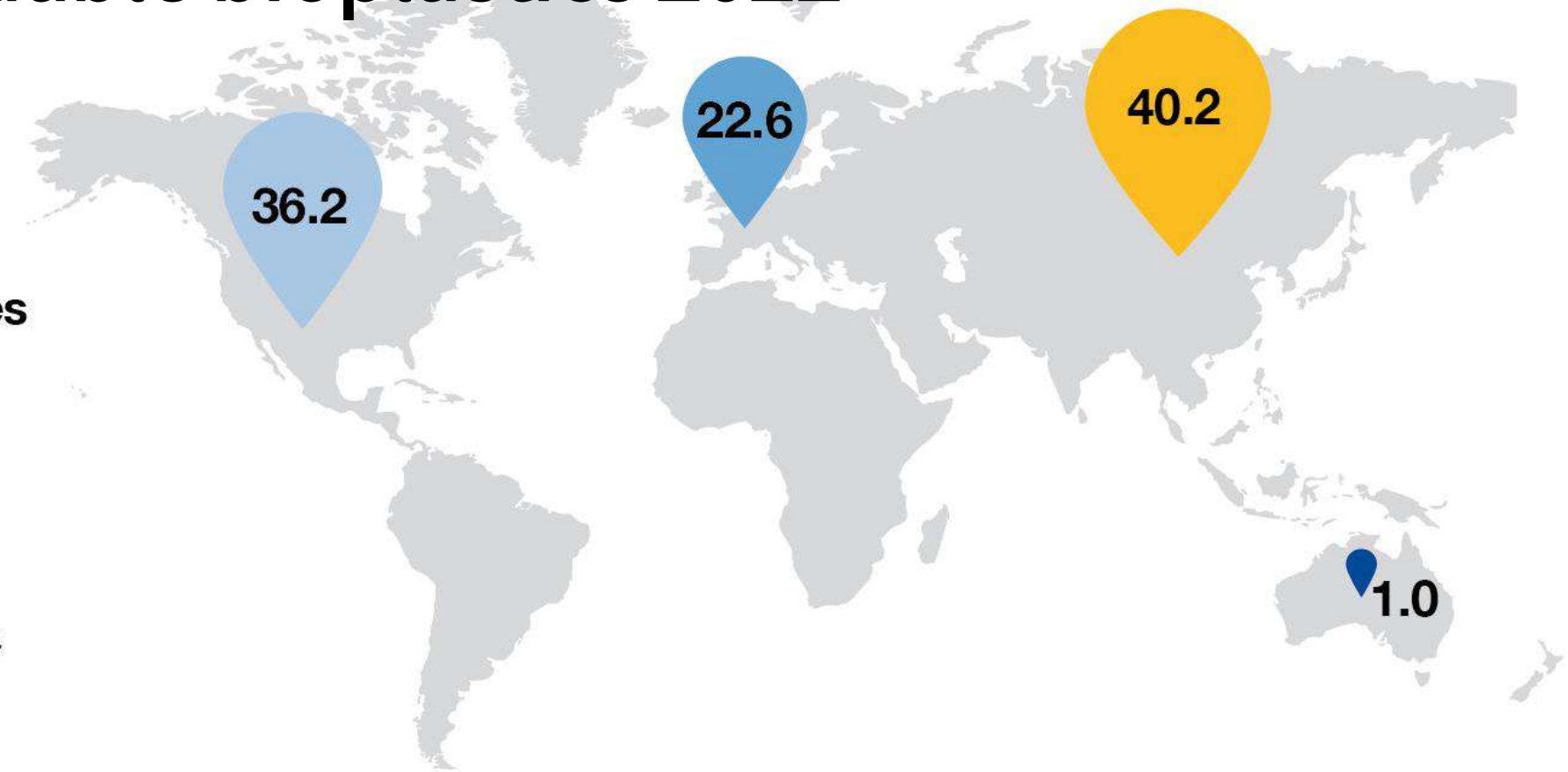


Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

Global production capacities of biodegradable bioplastics 2022

in %



Total:
1.14 million tonnes

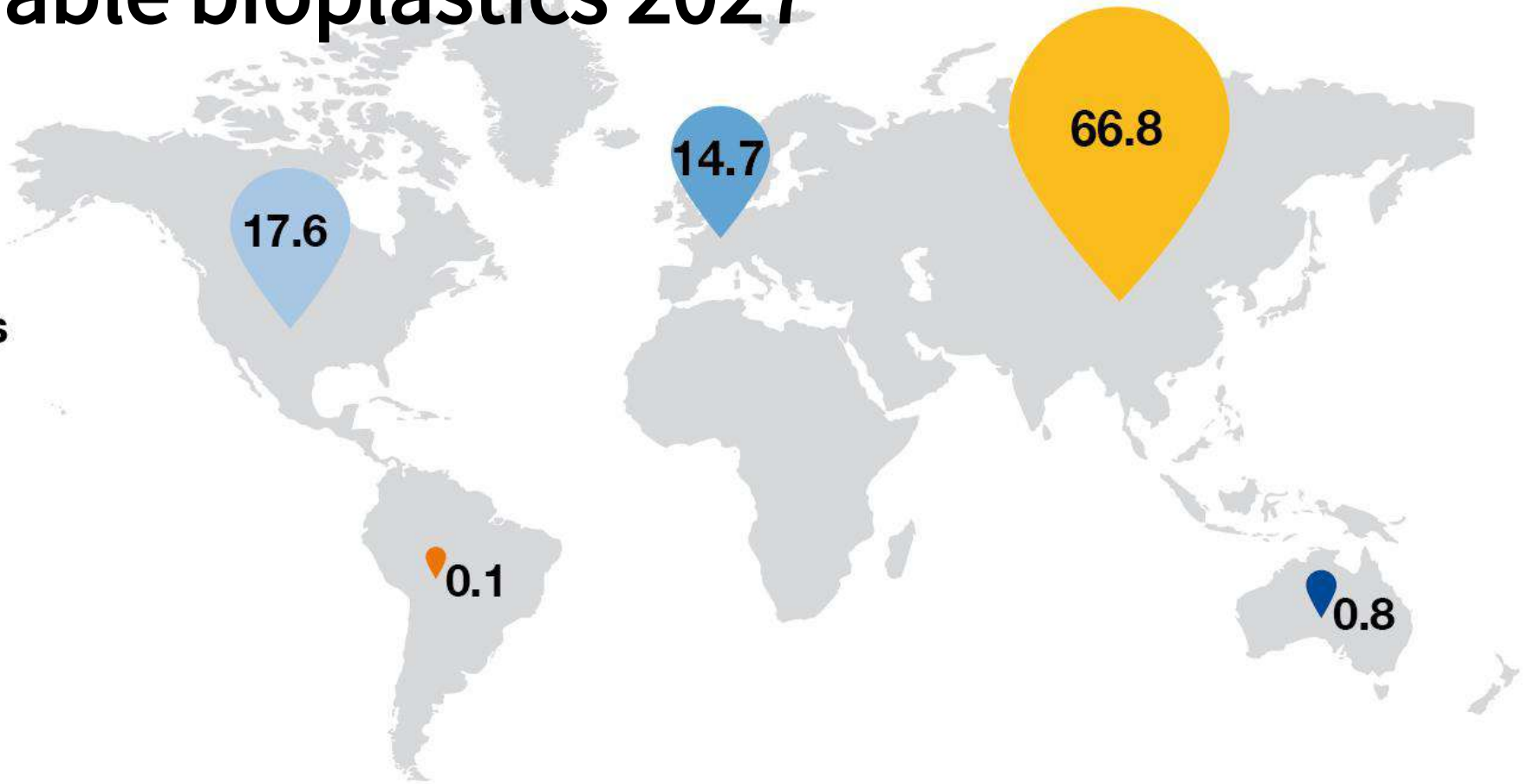
- Asia
- Europe
- North America
- Australia/Oceania

Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

Global production capacities of biodegradable bioplastics 2027

in %



Total:
3.56 million tonnes

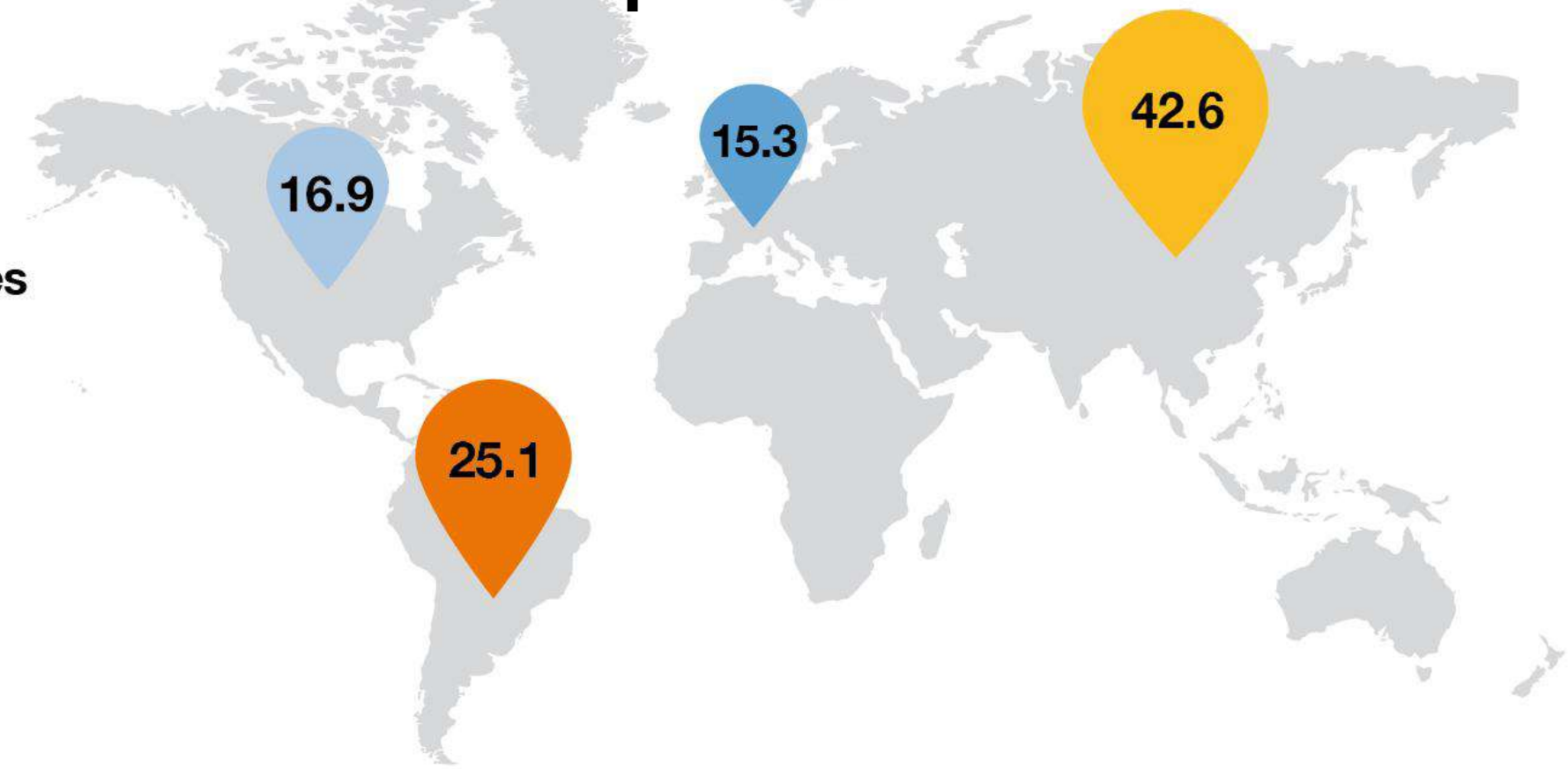
- Asia
- Europe
- North America
- South America
- Australia/Oceania

Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

Global production capacities of biobased and durable bioplastics 2022

in %



Total:
1.07 million tonnes

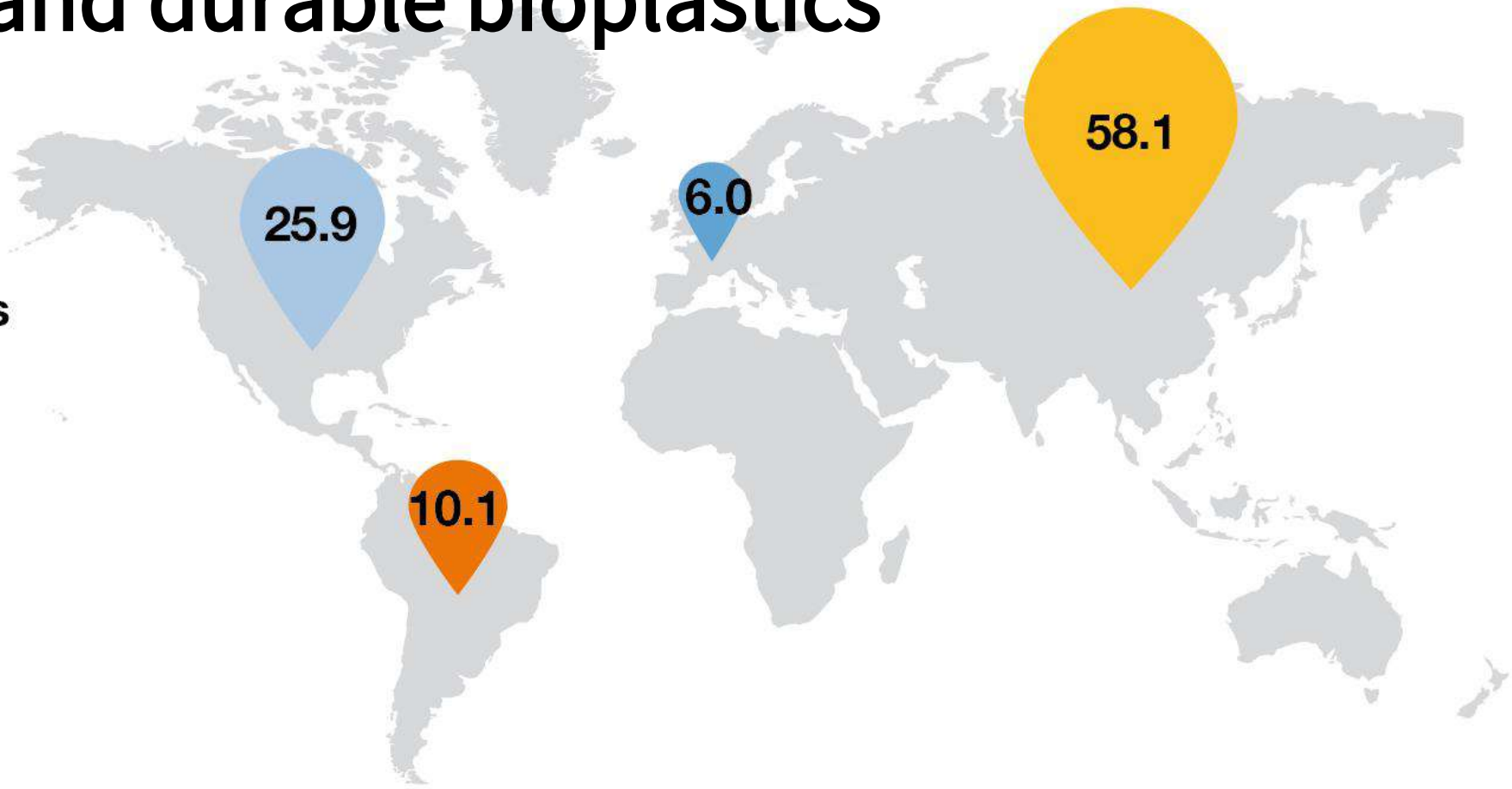
- Asia
- Europe
- North America
- South America

Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

Global production capacities of biobased and durable bioplastics 2027

in %



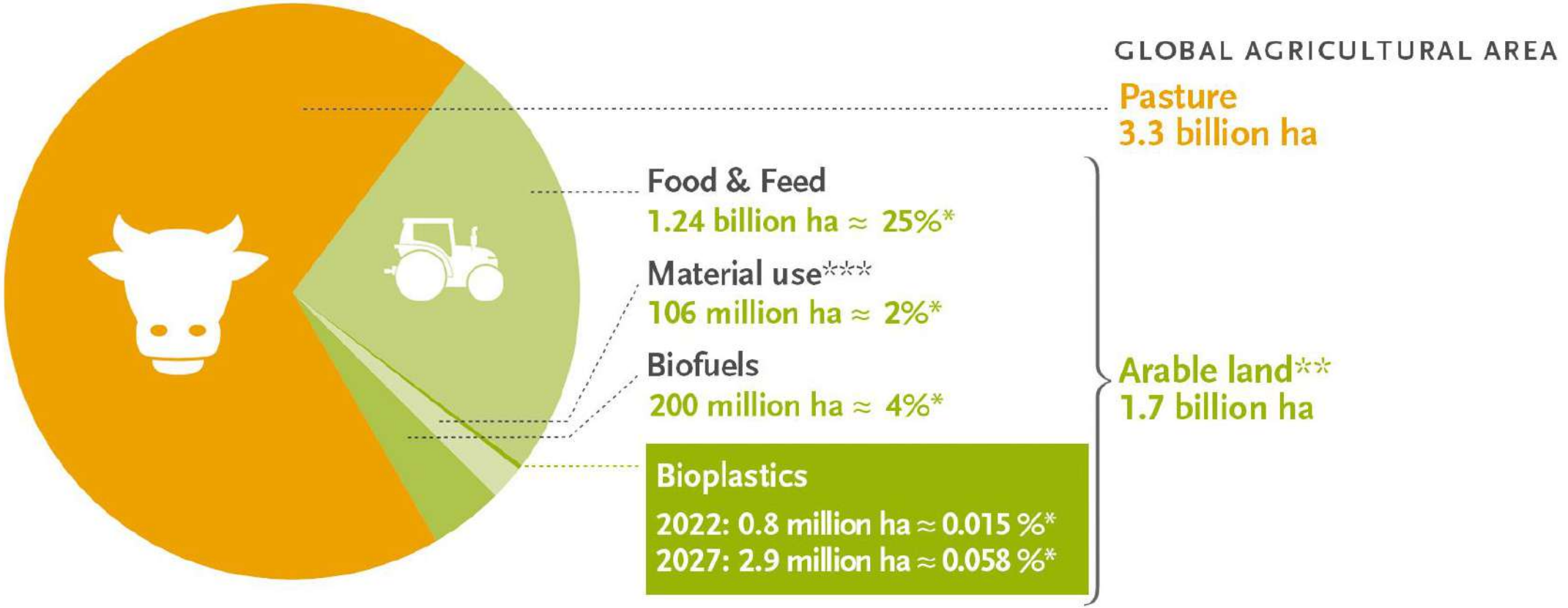
Total:
2.73 million tonnes

- Asia
- Europe
- North America
- South America

Source: European Bioplastics, nova-Institute (2022)

PLAST INDUSTRIEN

Landuse estimation for bioplastics



Source: European Bioplastics (2022), FAO Stats (2020), nova-Institute (2022), and institute for Bioplastics and Biocomposites (2019), University of Virginia (2016)

* In relation to global agricultural area
** Including approx. 1% fallow land
*** Land-use for bioplastics is part of the 2% material use

PLAST INDUSTRIEN