BIOCHAR EUROPE

European Biochar

Market Report 2025 | 2026

5th Edition
June 23rd, 2026

Introduction – Outline

a

Biochar Europe

b

Setting the scene

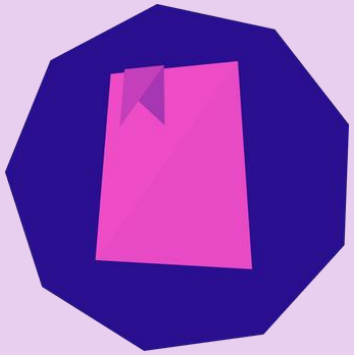
BIOCHAR EUROPE

Biochar Europe
has steadily
grown to
130 members

Status June 2026

OUR KEY ACTIVITIES

POLICY & ADVOCACY

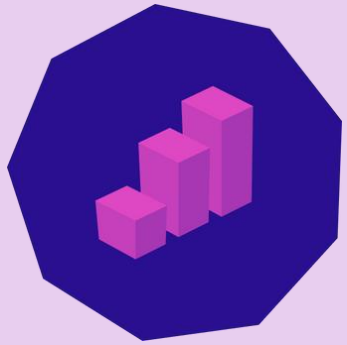


Promote and support the integration of legal regulations and incentives for the production and use of biochar.

INDUSTRY STANDARDS & REGULATIONS

Aid in the development of scientifically-backed standards and regulations for industrial biochar applications.

RESEARCH & MARKET INTELLIGENCE



Initiate and support research in order to close knowledge gaps, and produce Europe's annual biochar market report.

COMMUNICATION & ENGAGEMENT

Enhance awareness and understanding, connect stakeholders, and foster collaboration and synergies.

Introduction – Outline

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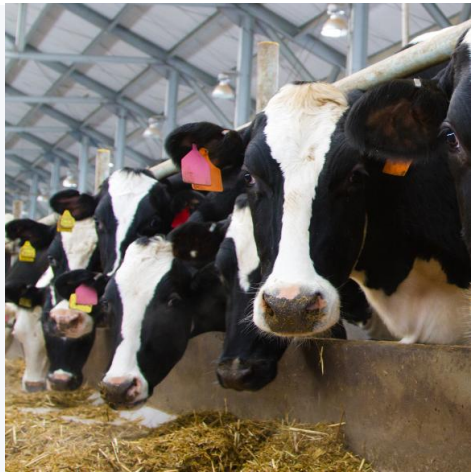
Setting the scene

Core Markets for Biochar



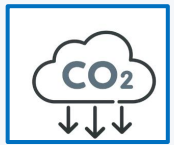
Growth potential

Growth dynamics

Core Markets for Biochar

Building Materials

- Currently modest volumes – pilot projects
- CO_2-certificates as main driver (insetting)
- High potential once regulatory barriers fall



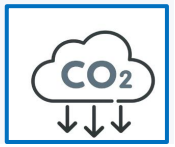
Metallurgy

- Sharply rising interest from the metallurgical industry, driven by ETS prices and defossilization targets
- Immense market potential – but prices under pressure
- Relevant volumes, rapid growth

Replacing Fossil Coal

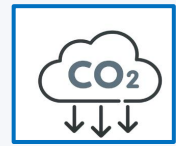
Agriculture

- Relevant market with diverse sub-applications
- CO_2-certificates essential for commercial deployment
- Limited growth



Urban Greening & Substrates

- Growing market, mainly from Scandinavia into DACH
- CO_2-certificates are carrying the use-case
- Steady growth



Growth potential

Growth dynamics

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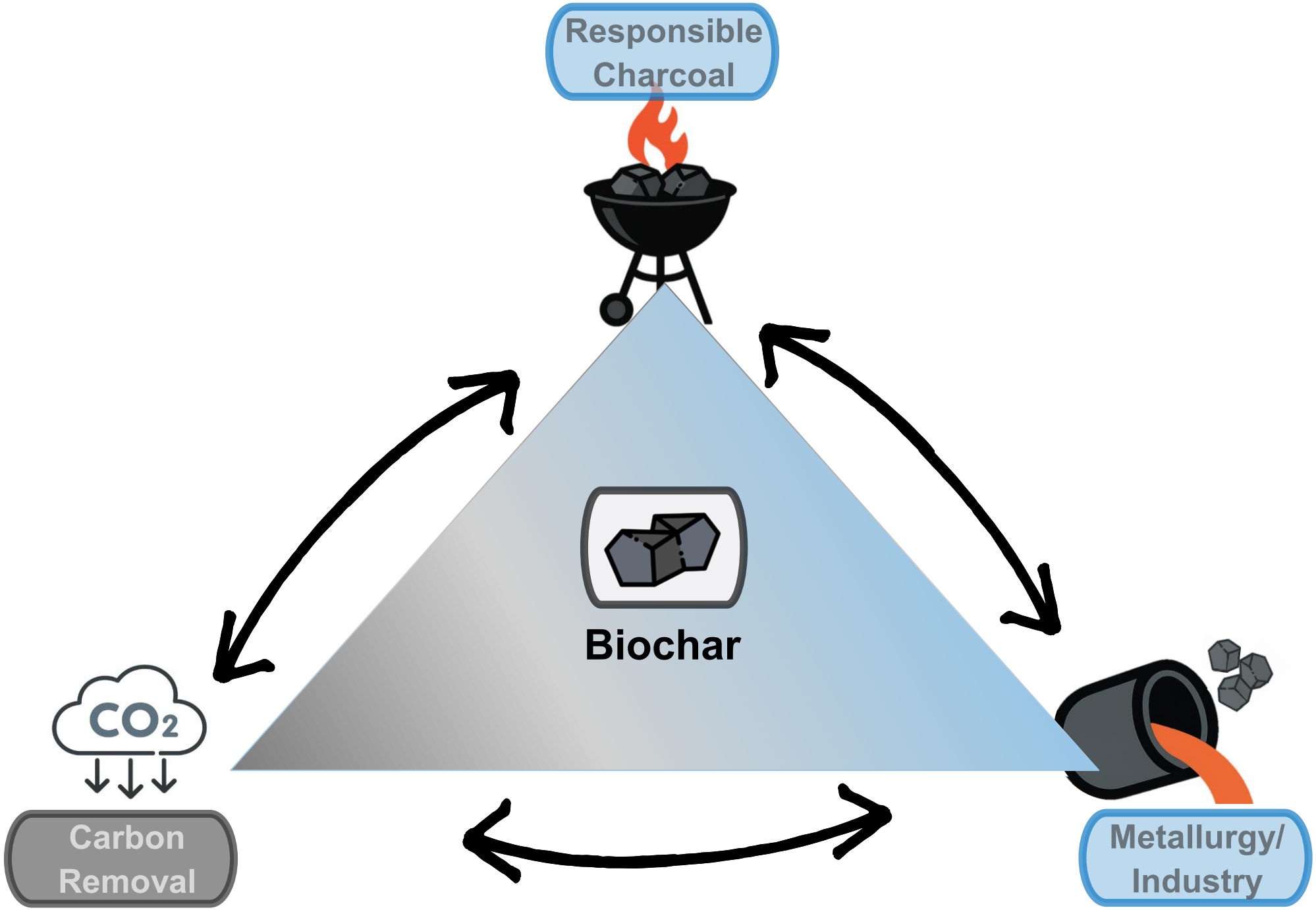
Substituting
fossil carbon in metallurgy
delivers
climate benefits
equal to or
greater than CDR


Responsible Charcoal
Biochar
CO2
Carbon Removal
Metallurgy/ Industry

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Authorship
- Biochar Europe

Published: *April 2026*

BIOCHAR EUROPE

Authorship

- Biochar Europe

Published: *June 2026*

Carbon Removal Standards and Methodologies for BCR

CARBON STANDARDS international

puro earth

ISOMETRIC

Rainbow™

EU CRCF

EU Carbon Removals and Carbon Farming Certification (CRCF) Regulation

United Nations Climate Change

Biochar EUROPE, developing a methodology for biochar under Article 6.4 of the Paris Agreement

VERRA

Verified Carbon Standard

Gold Standard for the Global Goals

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Growing scientific evidence sets **1,000-year permanence** as the new horizon in most standards

Growing evidence shows biochar can reach the 1,000-year horizon, but only under specific conditions: high-temperature, highly condensed biochar passing the strict gates.

Prof. Ondřej Mašek
(Biochar Summit 2026)

Biomass Certification is getting more important

Industrial applications will follow different rules than CDR

RED III

EUDR

REDcert EU

SURE SUSTAINABLE RESOURCES Verification Scheme GmbH

PEFC

ISCC International Sustainability & Carbon Certification

European Biochar Market Report 2025/2026 (5th Edition)

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- **Mattias Gustafsson** (Ecotopic)
- **Esko Salo** (VTT and the Nordic Biochar Network)
- The **Equipment Manufactures** and **Plant Operators** for Biochar production
- And many **other Members of Biochar Europe, Biochar experts** and **stakeholders**

23. June 2026

Biochar Europe (2026). European Biochar Market Report 2025/2026.
www.biochareurope.eu/resource/market-report-2025-2026

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Thanks for sponsoring the Market Report 2025/2026

Outline Market Report

1

Motivation, scope and methodology

2

Biochar manufacturing equipment

3

European Biochar Market 2025/2026

4

Reference Projects

Scope of the European Biochar Market Report 2025/2026

- We look at **Biochar/Biocarbon** production plants **installed in Europe until 2025** and **installations** that will be **commissioned in 2026**

- We look at **highly aromatized carbon**, suitable for **Carbon Removal applications** and **for Metallurgy/Industry**; we are **not looking into torrefied biomass**

- Definition of **categories** in terms of production volume

equipment category	method for calculating production capacity	completness
Micro (<200 t)	full production dedicated to **Carbon Removal**	medium
Small (200 - 449 t)		high
Med (low) (450 - 749 t)	mostly to **Carbon Removal**, individual split when info was available	very high
Med (high) (750 - 1.499 t)		very high
Large (1.500 - 2.499 t)	individual split btw. (i) **BBQ/Energy**, (ii) **Metallurgy/Industry** and (iii) **Carbon Removal** applications	very high
Very large (2.500 t - 4.999 t)		very high
Industrial (≥ 5.000 t)		very high

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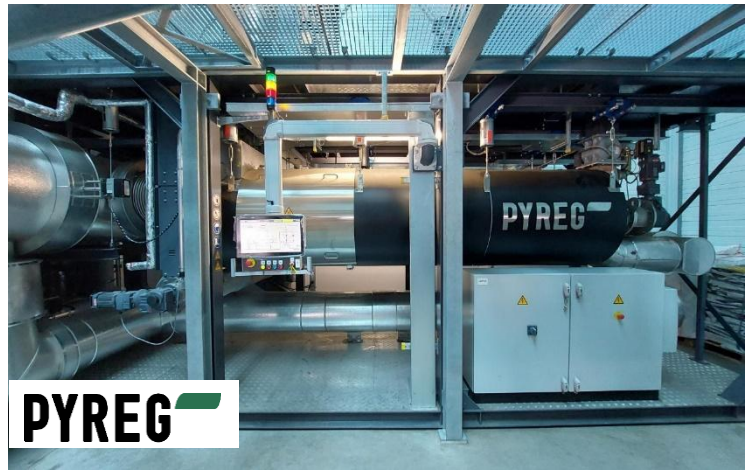
Broad variety of technology providers

30 technology providers, several of them undoubtedly at TRL9

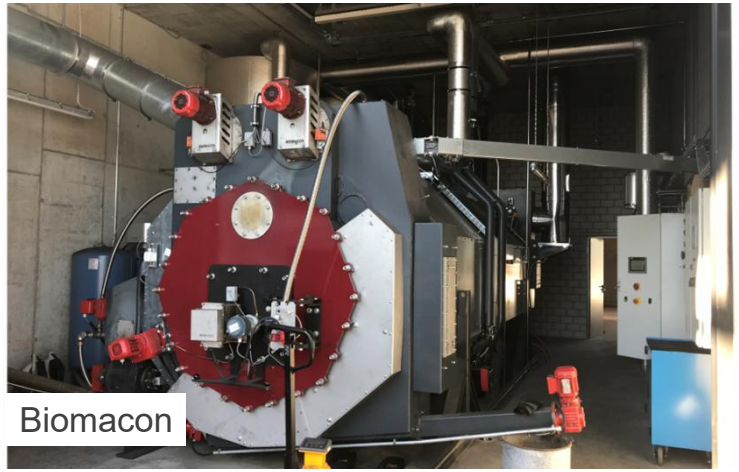


Exemplary pyrolysis equipment providers

There are over 30 technology providers on the market in Europe, with some having installed dozens of systems

Equipment manufacturers

Examples for industrial equipment producing Biochar



Equipment manufacturers

Examples for industrial equipment producing Biochar

Equipment manufacturers

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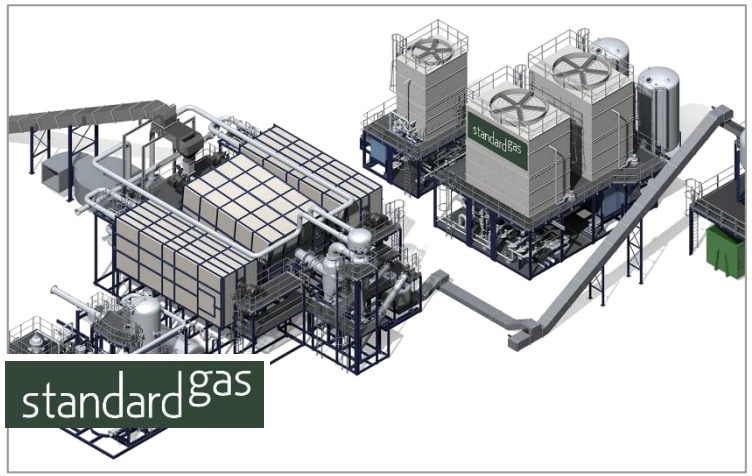
Examples for industrial equipment producing Biochar



The above overview of equipment manufacturers is not exhaustive!

If you are aware of further and new equipment manufacturers relevantly active in Europe, please let us know.

Concluding on Equipment

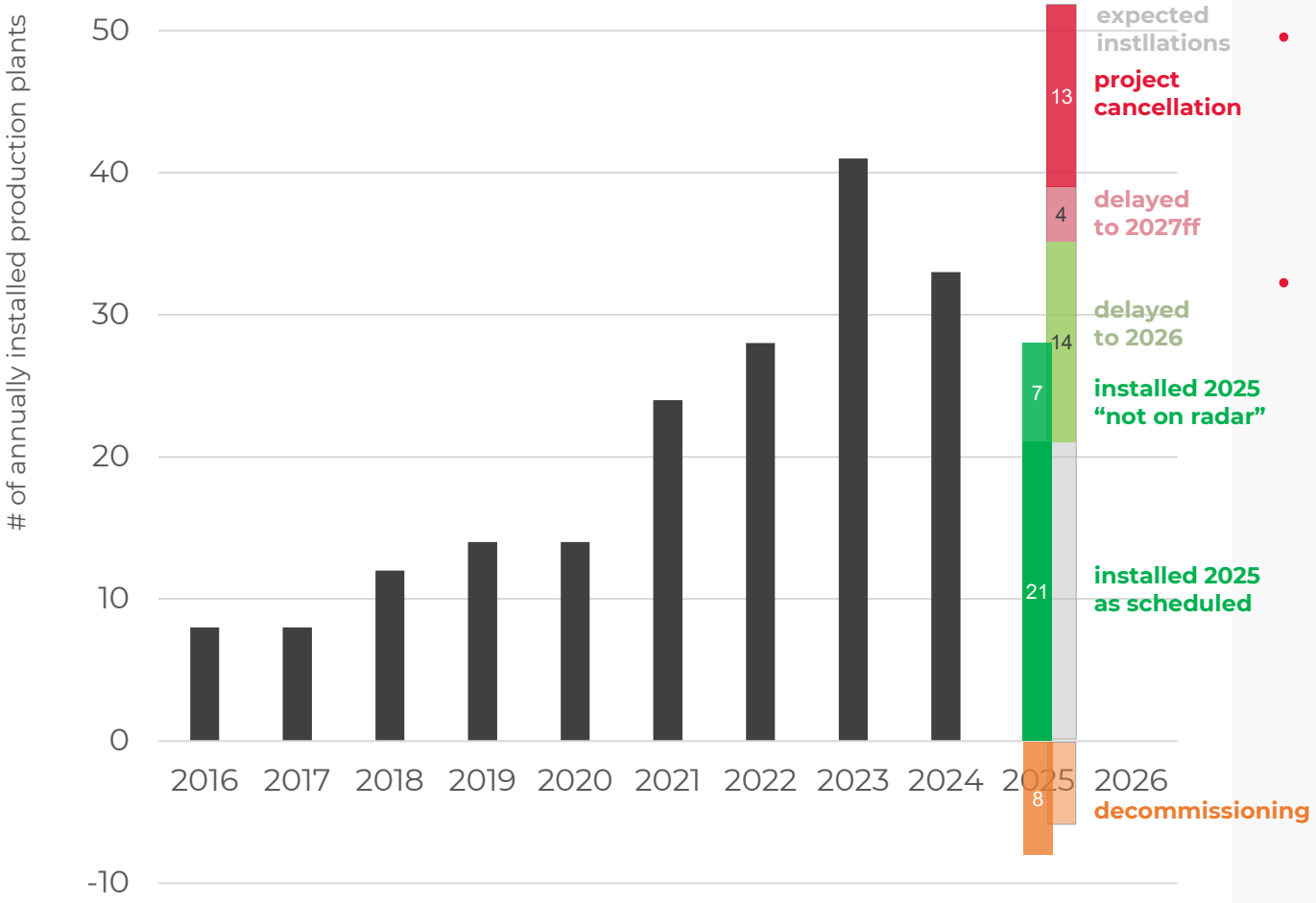
- Technical diversity — and that's a good thing
- Output ranges from a few hundred to several thousand tons per year
- Several companies at TRL 9, many more at TRL 8
- Still new equipment suppliers entering the market
- Many plant operators serve more than one of the three markets

Outline Market Report

1. Motivation, scope and methodology
2. Biochar manufacturing equipment
3. European Biochar Market 2025/2026
4. Reference Projects

Biochar market growth

Annually installed Biochar production plants* in Europe



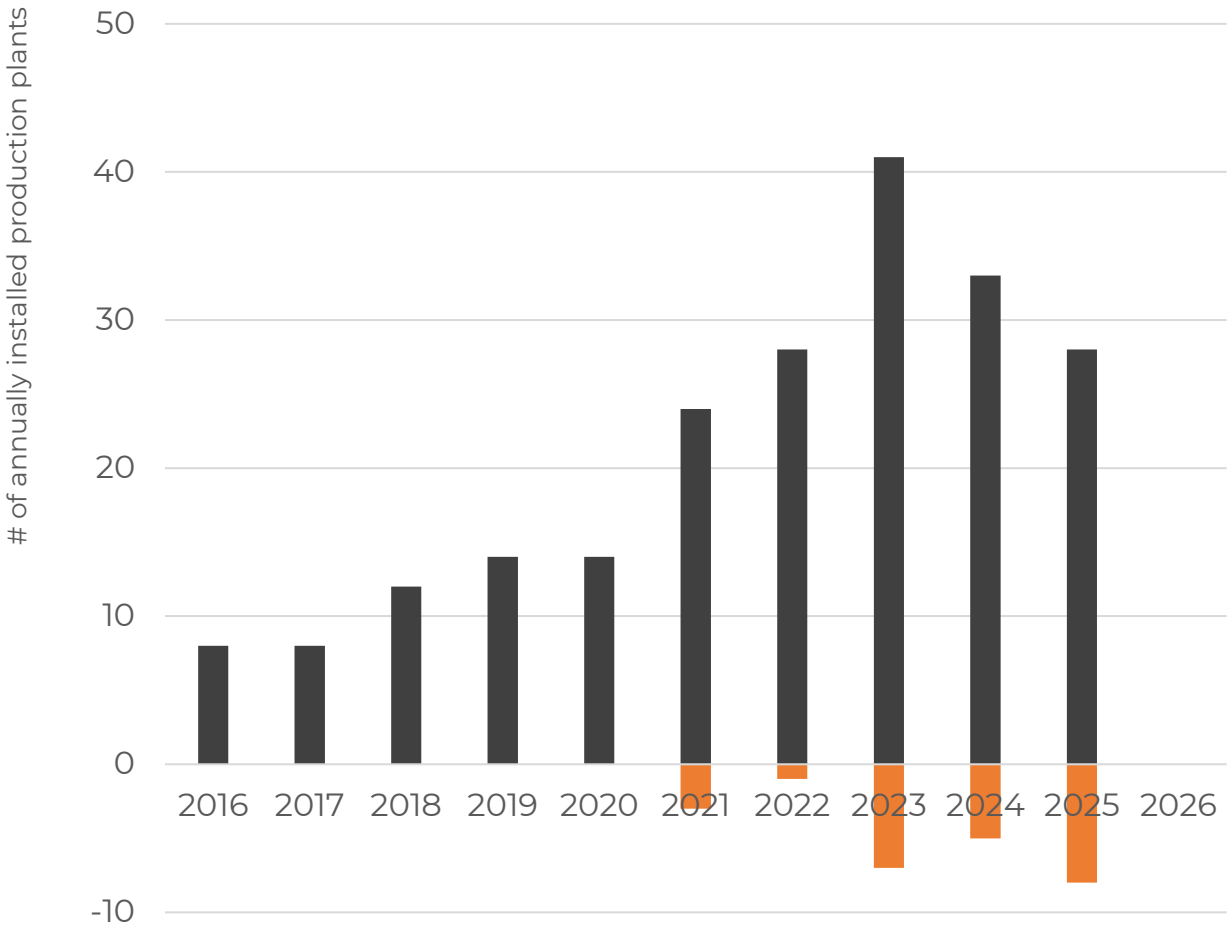
- In **last year's Market Report**, we had **anticipated for 2025** a **net increase of 46 plants** (52 new projects and 6 expected decommissionings)
- In **2025** a total of **28 Biochar production plants** have been **installed** and **8 plants have been shut down**
  → Net increase 20 plants

www.biochareurope.eu/resource/market-report-2025-2026 © Biochar Europe 2026

* Installations with clear R&D character not included

Biochar market growth

Annually installed Biochar production plants in Europe



- In total **27 plants** have been **decommissioned** from 2010 to 2025

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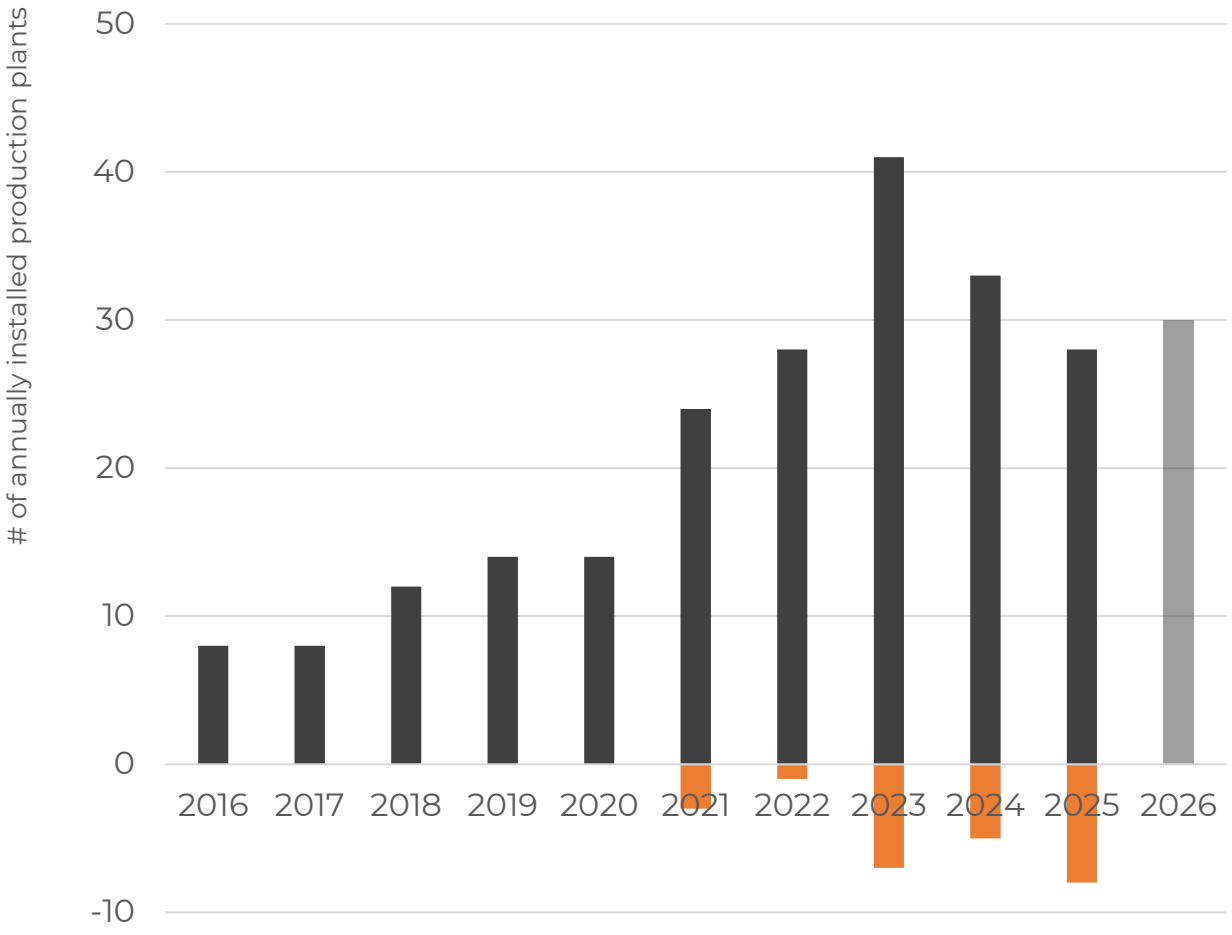
Biochar market growth

Annually installed Biochar production plants in Europe



- In total **27 plants** have been **decommissioned** from 2010 to 2025
- For **2026** we expect **30 Biochar production plants** to be **installed and commissioned**

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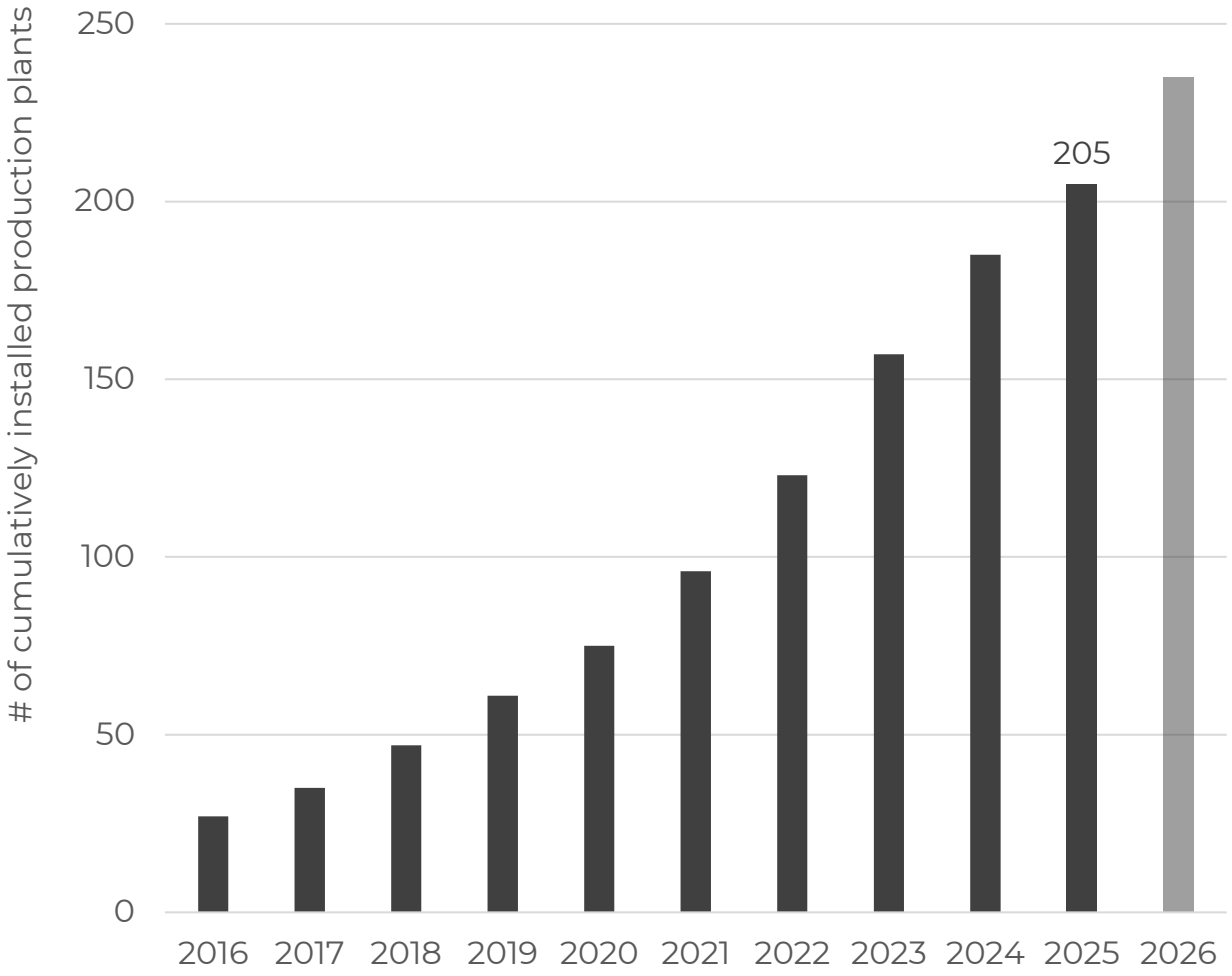
Biochar market growth

Cumulative net number of Biochar production plants in Europe



- By end of **2025, the cumulative net number** of biochar production plants in Europe has **grown to 205 installations**
- Until the end of **2026, the cumulative number** of installed production plants in Europe is **expected to grow to around 235 installations**

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* Installations with clear R&D character not included

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Two realities in the market

Challenges

Technical issues
Commercial challenges

Delivering as promised

Built on time & on budget
Operating at specifications

... all this is just normal for an emerging industry

Key Success Factors

- Proven technology with strong operational track record (TRL 9 / TRL 8+)
- Experienced, motivated, and well-incentivized operators
- Long-term, cost-competitive biomass supply secured (professional feedstock sourcing)

Delivering as promised

Built on time & on budget
Operating at specifications

Challenges

Technical issues
Commercial challenges

Root causes for failed or underperforming projects

- Failure to fully monetize waste heat
- Technical and operational issues in immature technology systems (TRL < 8)
- Unrealistic business cases driven by overly optimistic assumptions and insufficient financial planning

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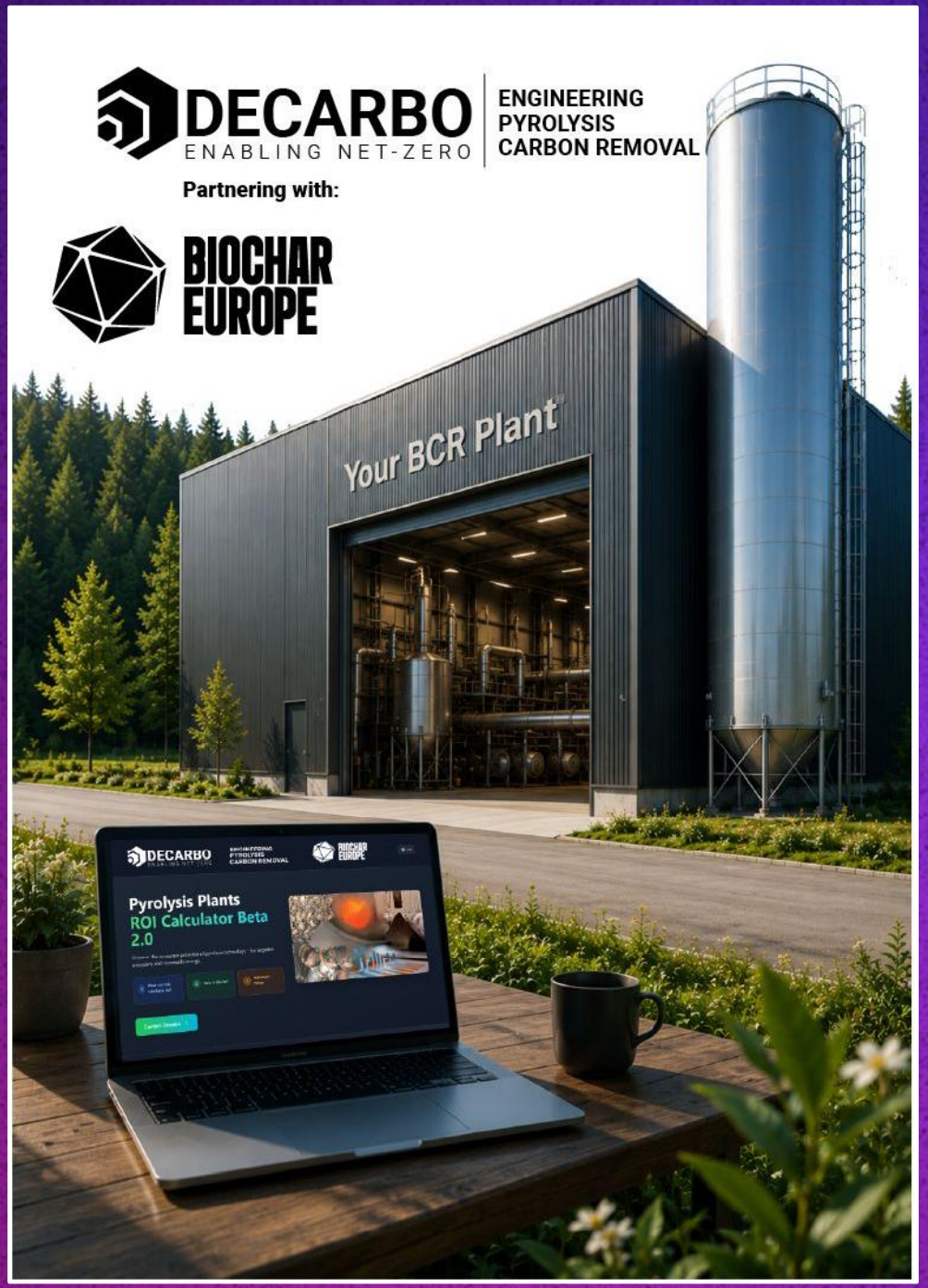


Pyrolysis Plants ROI Calculator Beta 2.0

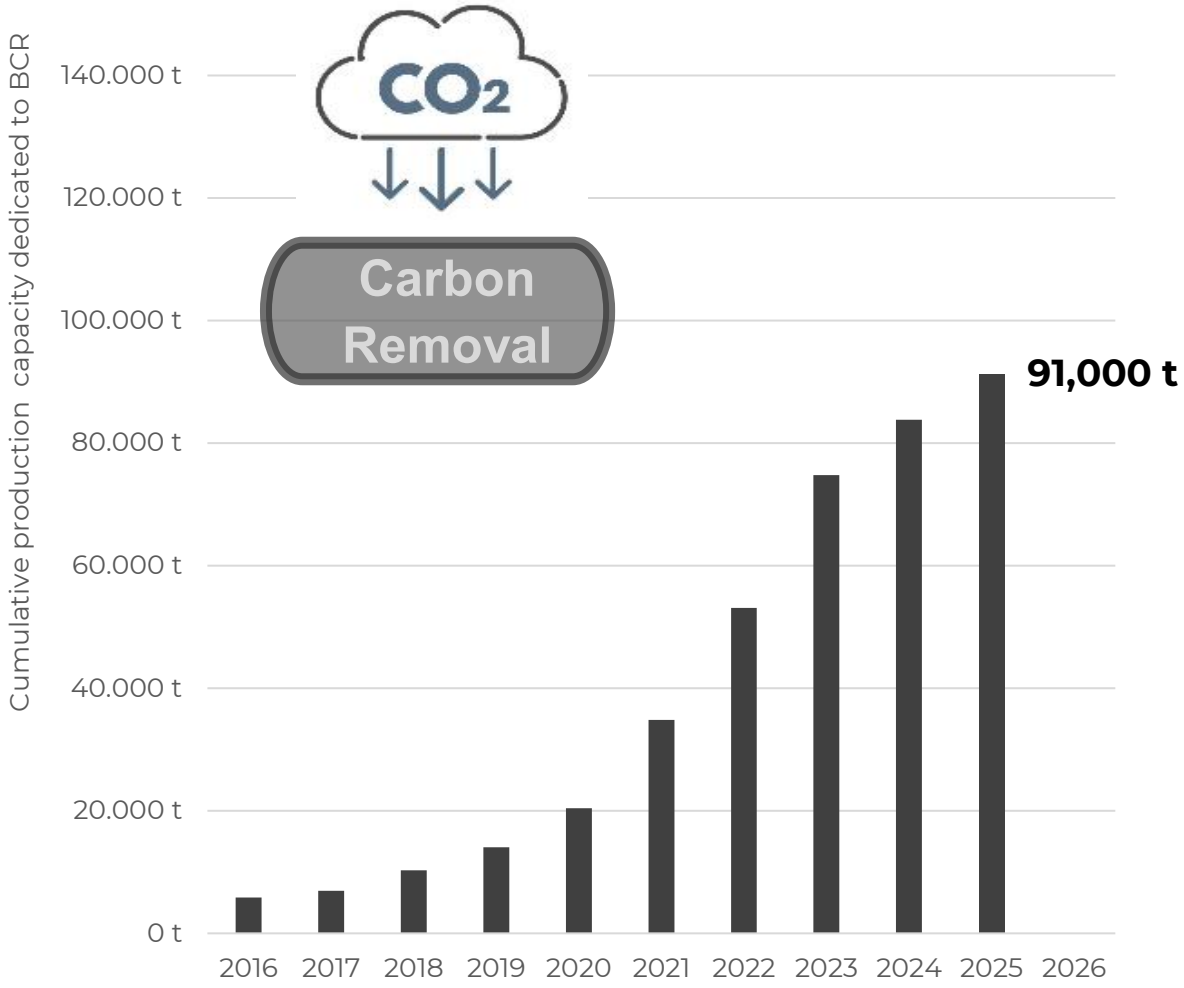
Biocharroi Calculator

Authorship
- Decaro-Engineering

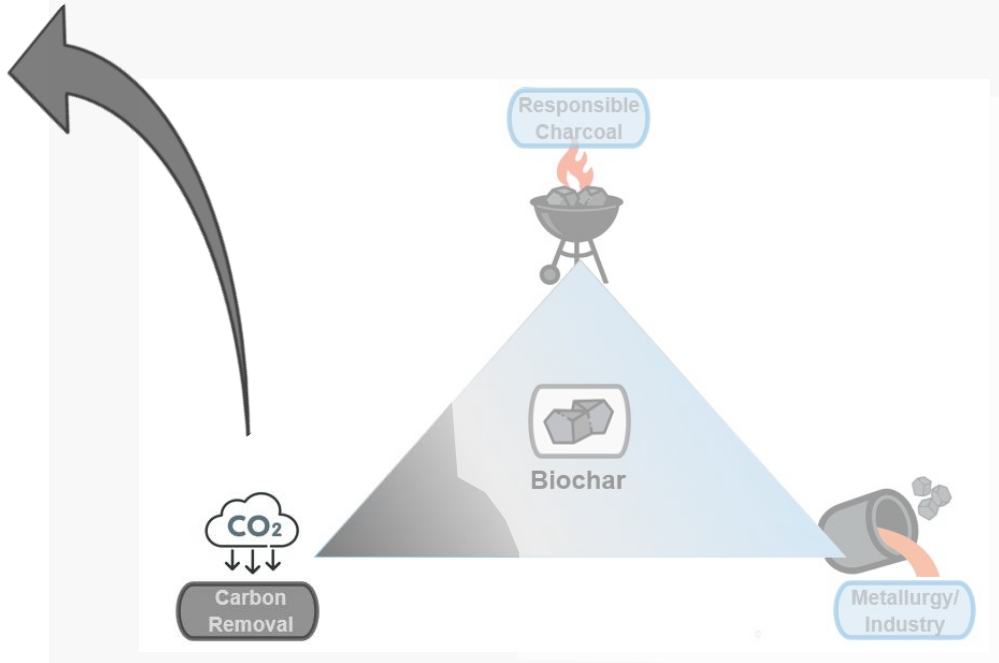
Published: *June 2026*

Biochar market growth and growth rates

Cumulative biochar production capacity dedicated to BCR in Europe



- Biochar production capacity dedicated to BCR continues to **growth**, but slower than previous years. In **2025** it **grew to 91,000 t** Biochar.



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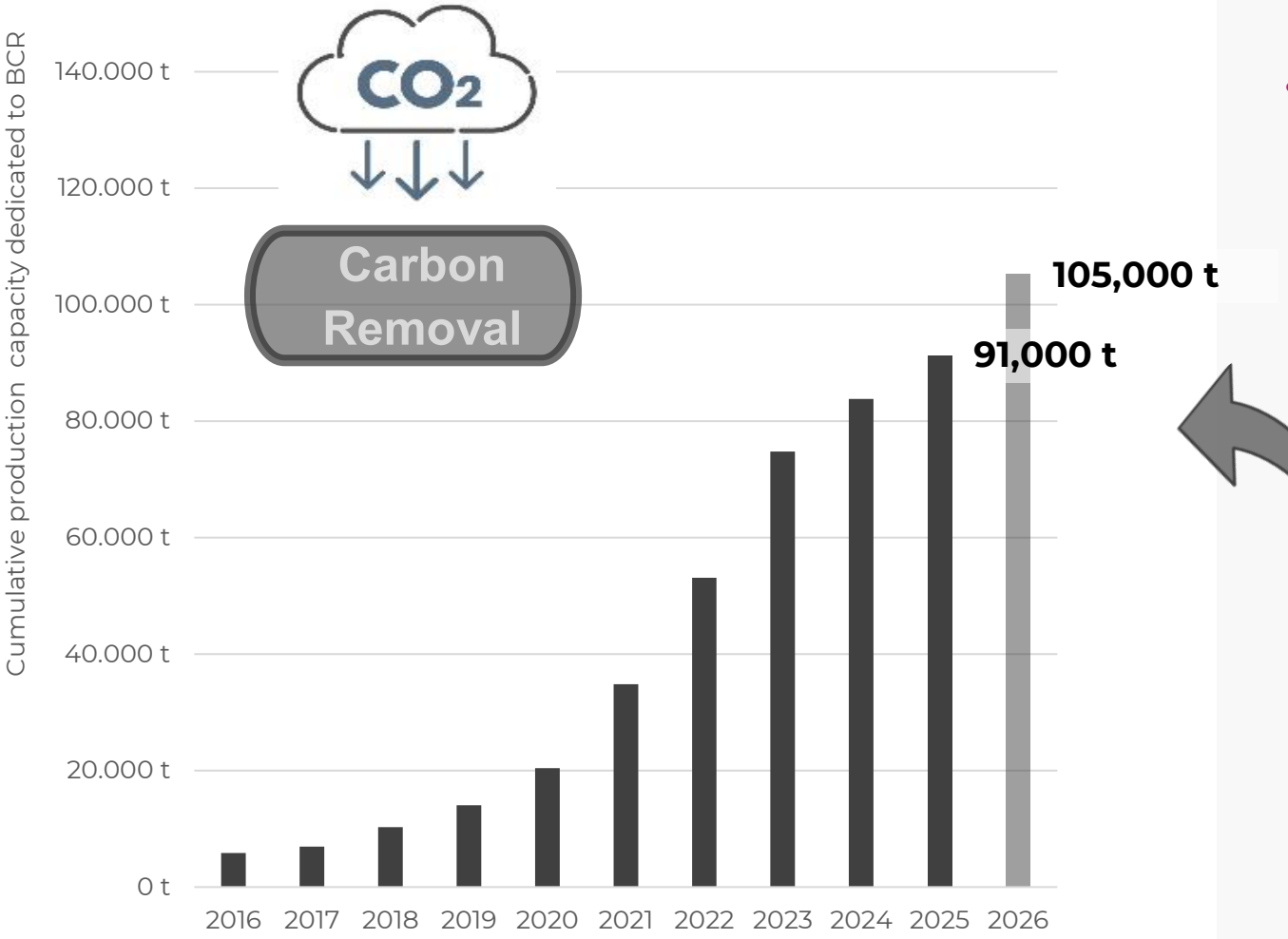
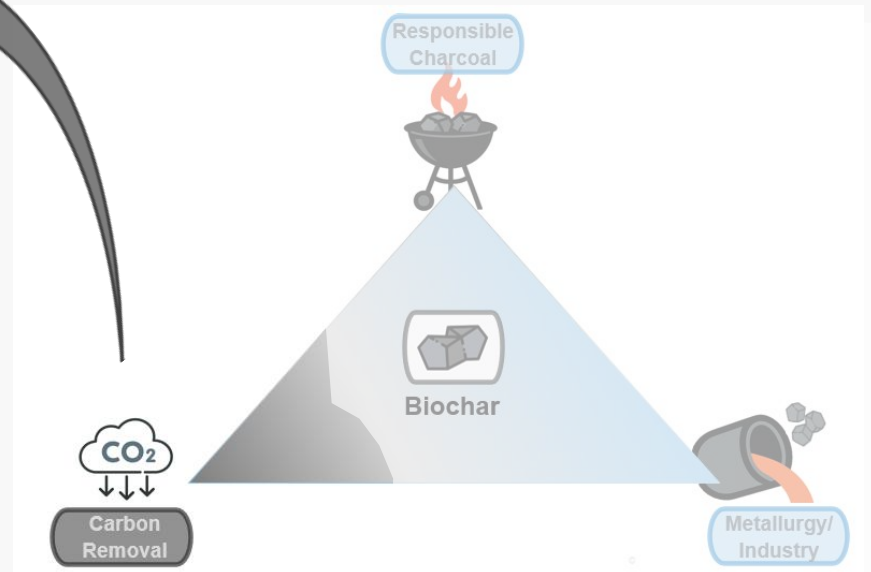
Biochar market growth and growth rates

Cumulative biochar production capacity dedicated to BCR in Europe



- According to data provided by producers and project developers for 2026, **production capacity** dedicated to BCR **is expected to grow to 105,000 t**



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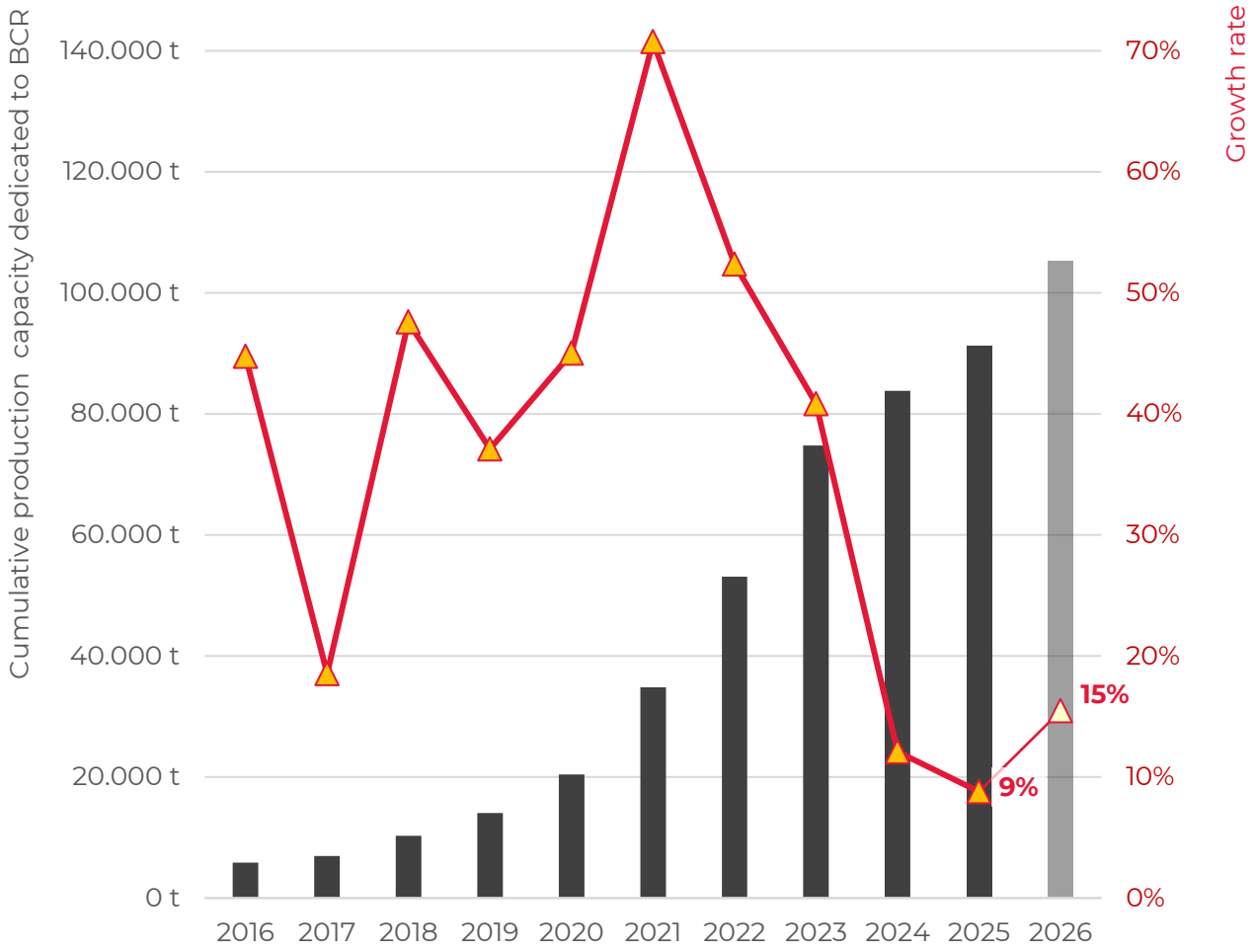
Biochar market growth and growth rates

Cumulative biochar production capacity dedicated to BCR in Europe



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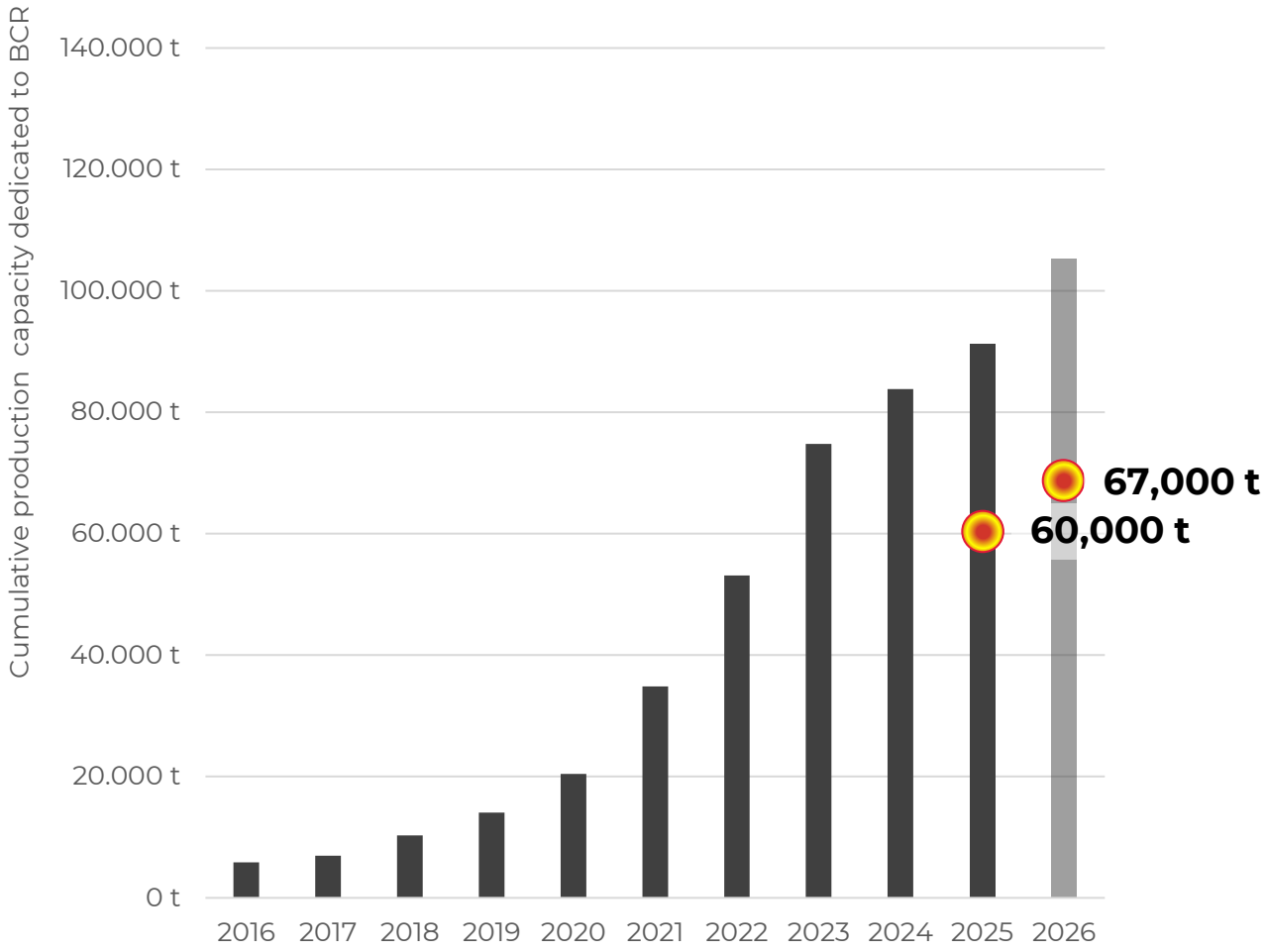
- **The CDR market segment is still growing, but much slower than before**
  - New production capacity is increasingly targeting industrial biochar markets instead of the CDR segment
  - Project postponements and cancellations have significantly slowed market expansion

From production capacity to actual Biochar production for BCR



- Assumptions for assessing the **actual Biochar production**
  - 6 months operation and **50% uptime** in the **commissioning year**
  - 12 months operation and **70% uptime** in **following years**

  both percentages are unchanged from last year's report
- This leads to **60,000 t of Biochar** production in **2025** dedicated to BCR
- For **2026**, we expect ~**67,000 t of Biochar** dedicated to BCR

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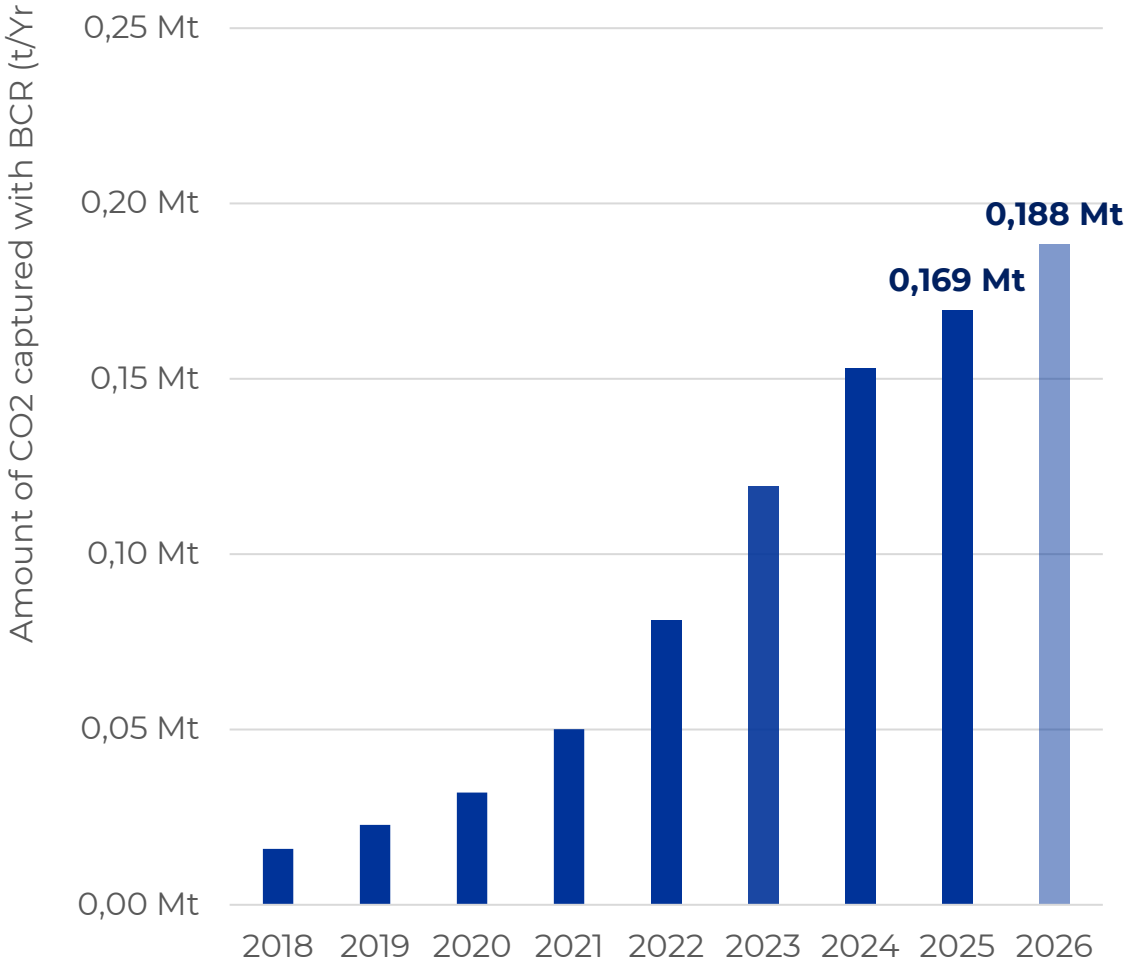
From BCR dedicated Biochar to CO_2 amount captured with BCR



- The above biochar volumes in **2025** are equivalent to **170,000 t of CO_{2e}**
- For **2026** we can expect around **190,000 t of CO_{2e}**

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BCR is today's
most relevant industrial
CDR technology
for **permanent carbon**
removal in Europe

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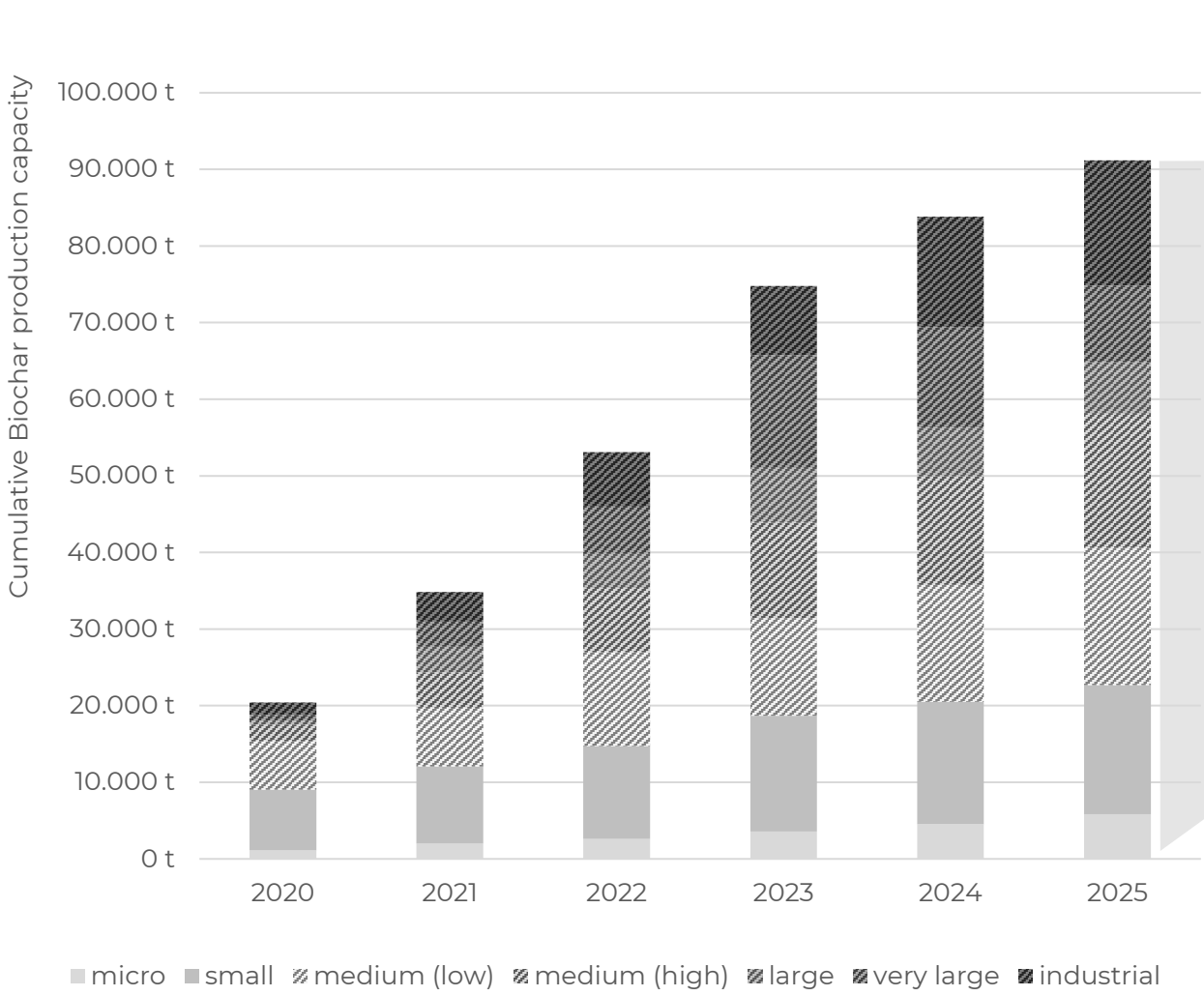
Scaling of BCR depends on **adequate politically support** (compliance markets, ETS)

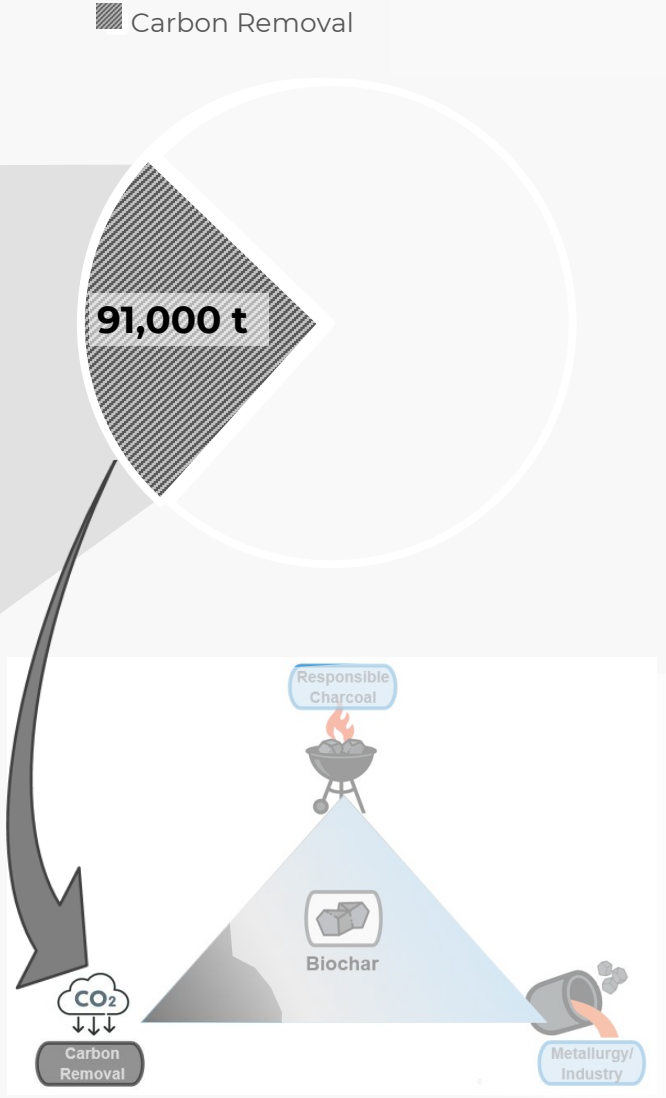
BIOCHAR EUROPE

Based on a
solid technical basis
(TRL9)
the sector is
ready to
speed up growth

Biochar production by size of equipment

Cumulative Biochar production capacity dedicated to BCR in Europe





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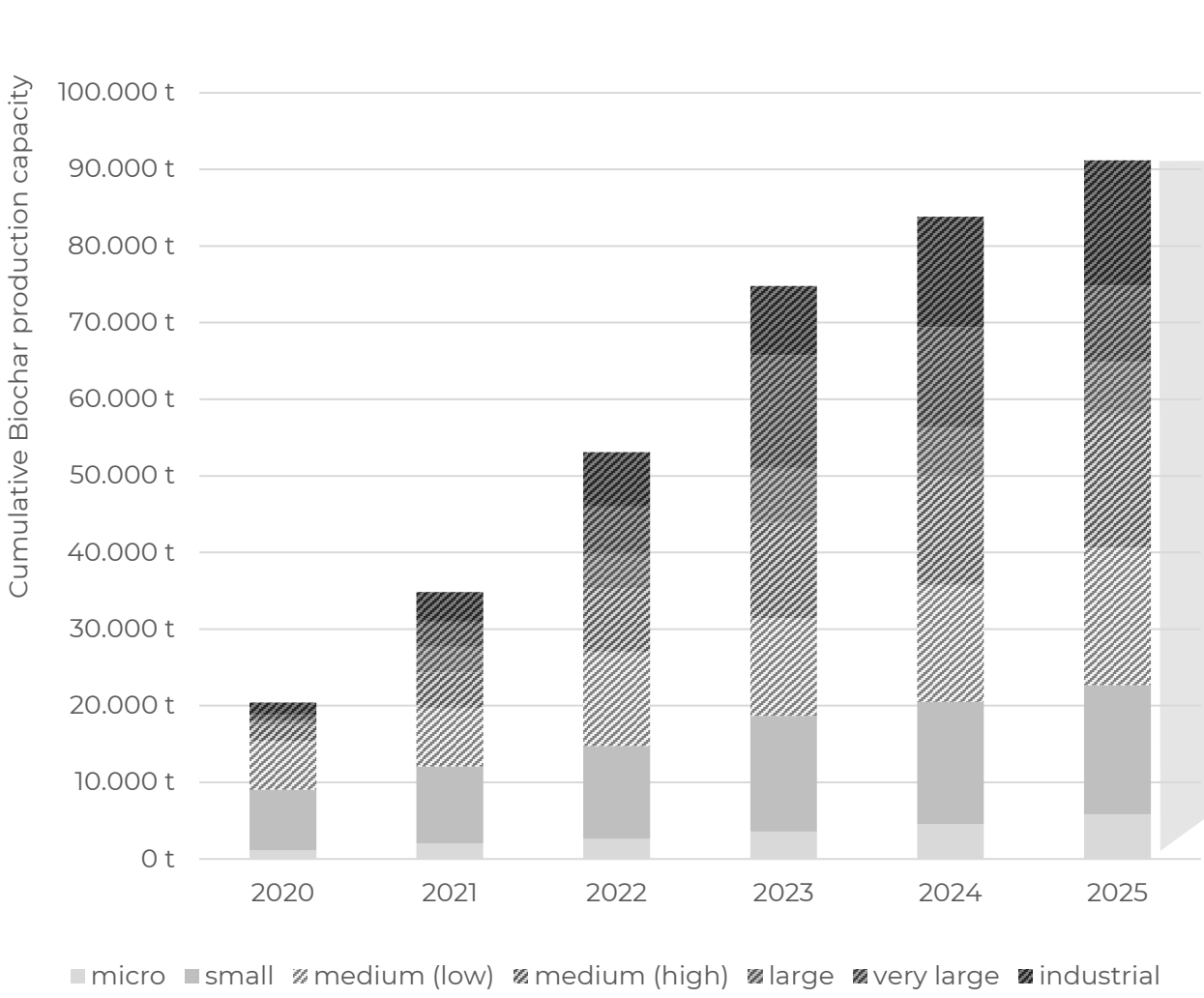
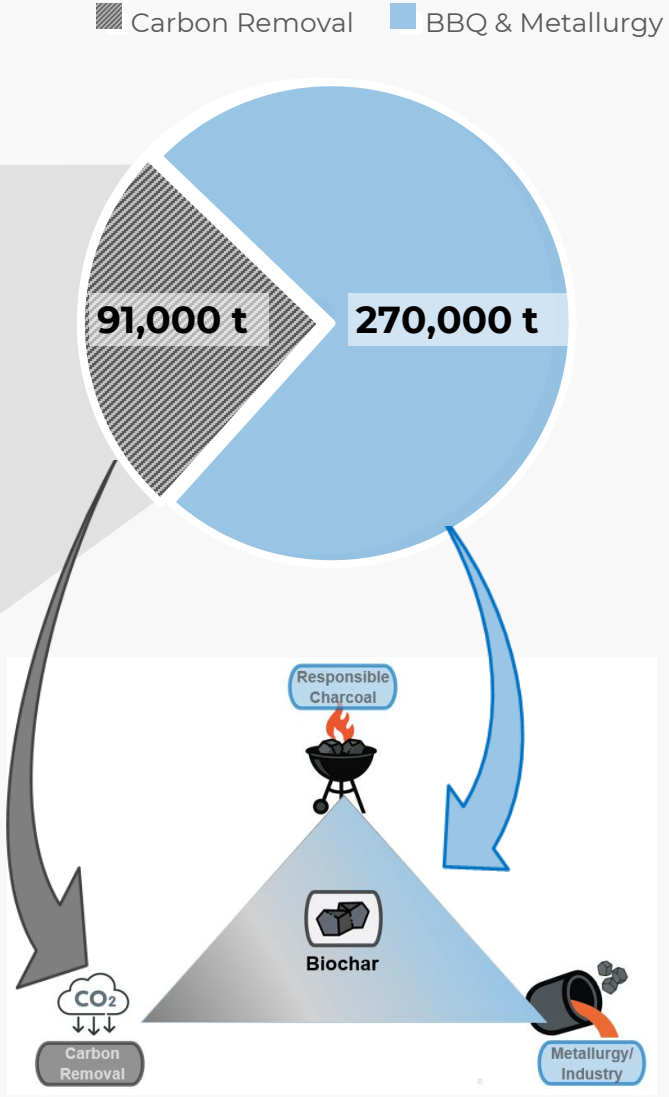
Biochar production by size of equipment

Cumulative Biochar production capacity dedicated to BCR in Europe





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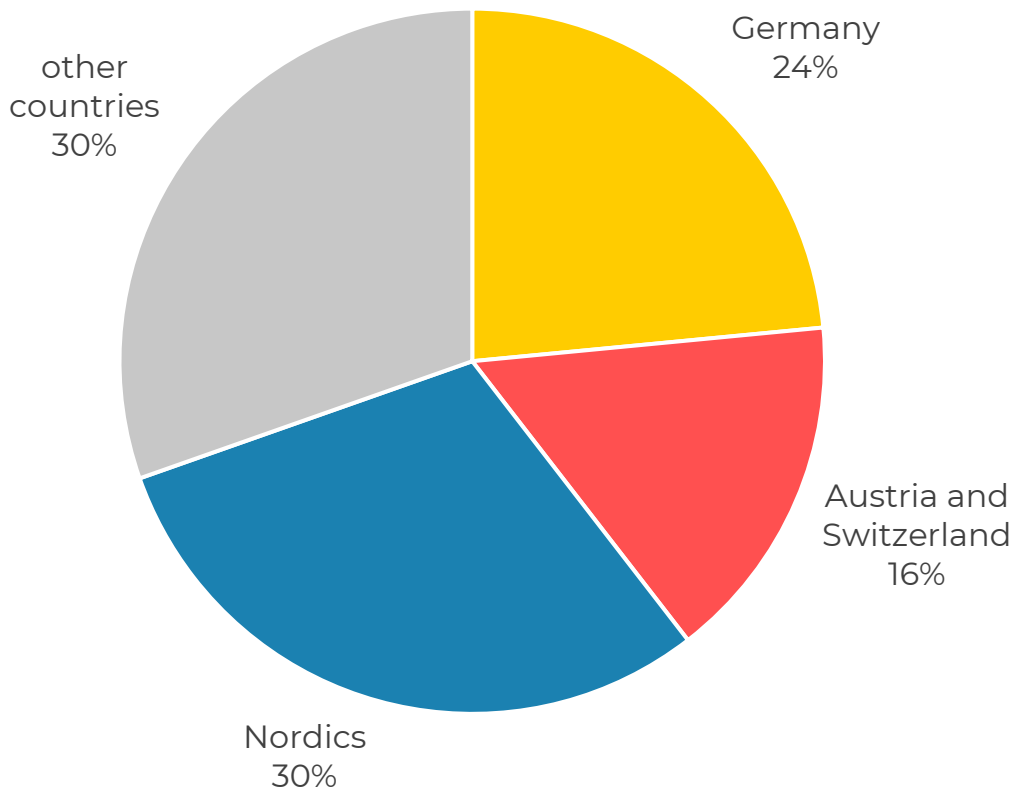
Biochar production by regions/countries

Cumulative Biochar production capacity dedicated to BCR in Europe end of 2025



- About **70%** of the **production capacity** end of **2025** is distributed among **three dominating regions/countries:**
  - Germany
  - Nordics
  - Austria and Switzerland

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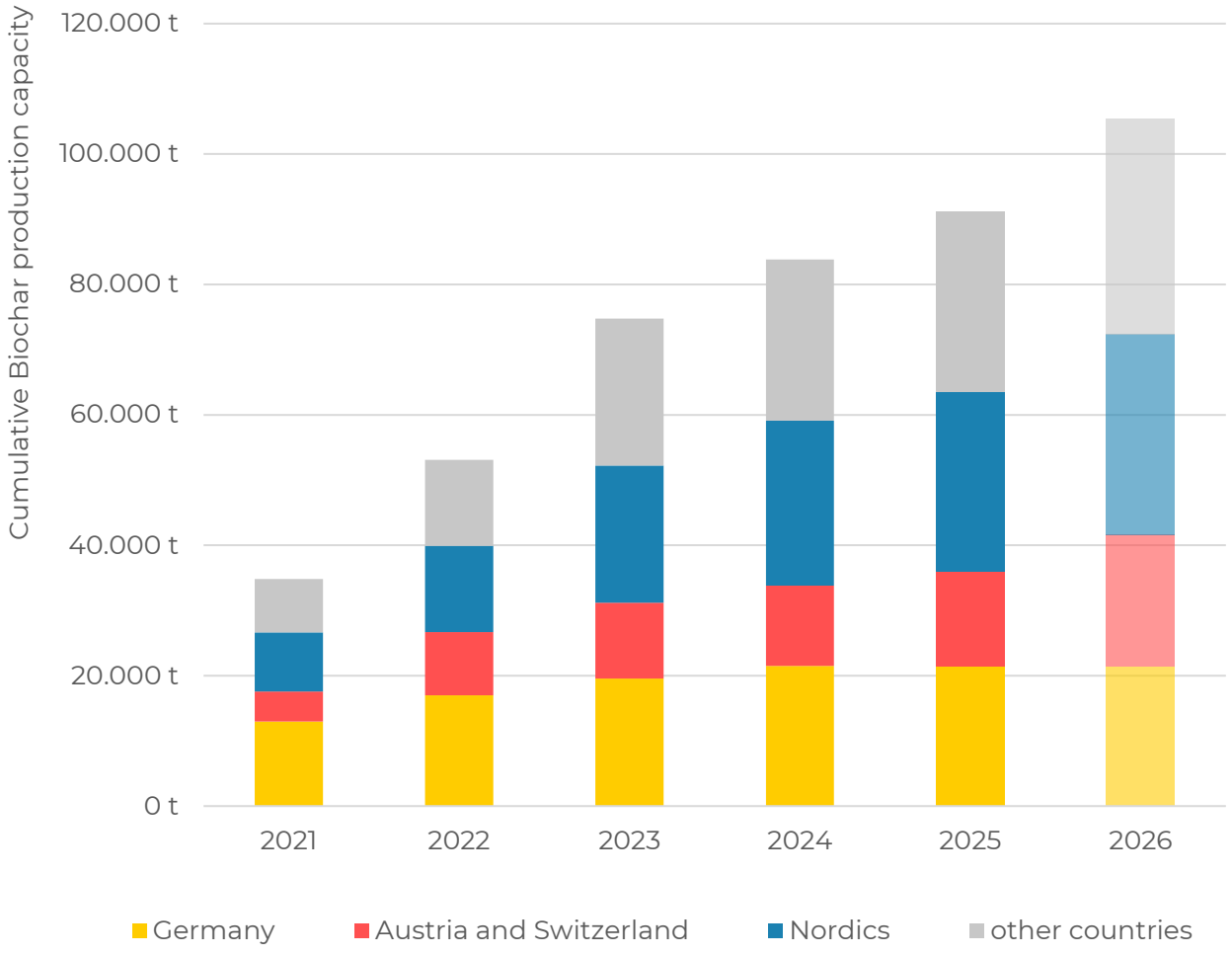
Biochar production by regions/countries

Cumulative Biochar production capacity in Europe dedicated to BCR since 2021



- **Germany** remains the **country** with the highest **production capacity**, but at **stagnating (net) volumes**
- **Austria & Switzerland** is **growing** steadily (highest growth rates)
- The **Nordics** has **grown very fast**
  - with **Sweden, Denmark** and
  - **Finland**

  being the countries with the most relevant activities
- The share of "**other countries**" is **steadily increasing** with most relevant activities
  - in **Spain**
  - **France** and
  - **United Kingdom**

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1

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3

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4

Reference Projects

Combined heat & power – Stanglwirt

Reference Project – Category “Medium (low)”

Austria

- Customer: **Stanglwirt**
- Equipment: **CW1800-500**
- Commissioning: **2024**
- Feedstock: **Regional residual forest wood**
- Surplus energy use:
  - **5.5 GWh/yr renewable heat** for the hotel’s own **heat demand**
  - **3.75 GWh/yr electricity** (self consumption)
- Biochar production: **500 t/yr Biochar**
  up to 1,500 t CO_{2e}

Sewage sludge pyrolysis – Margretelund

Reference Project – Category “Medium (low)”

Sweden

- Customer: **Roslagsvatten**
- Equipment: **Hecla® Setores 1.500**
- Commissioning: **2026**
- Feedstock: **Sewage sludge 6.000 t/yr**
- Surplus energy use: **2,9 GWh/yr excess heat** for local heating needs
- Biochar production: **500 t/yr Biochar** with up to 35% carbon used as soil improver; **675 t CO_{2e}**

Roslagsvatten

Florida Crystals

Reference Project – Category “Medium (high)”

US – Florida

- Customer: **Florida Crystals**
- Equipment: **3 x PYREG PX1500**
- Commissioning: **2024 & 2025**
- Feedstock: **Rice hulls**
- Surplus energy use: **13.5 GWh_{th} prosess heat** for drying of rice
- Biochar production: **2,400 t/yr of Biochar** corresponding to **6,700 t CO_{2e}**

Sieve overflow pyrolysis – Fruedal

Reference Project – Category “Medium (low)”

Denmark

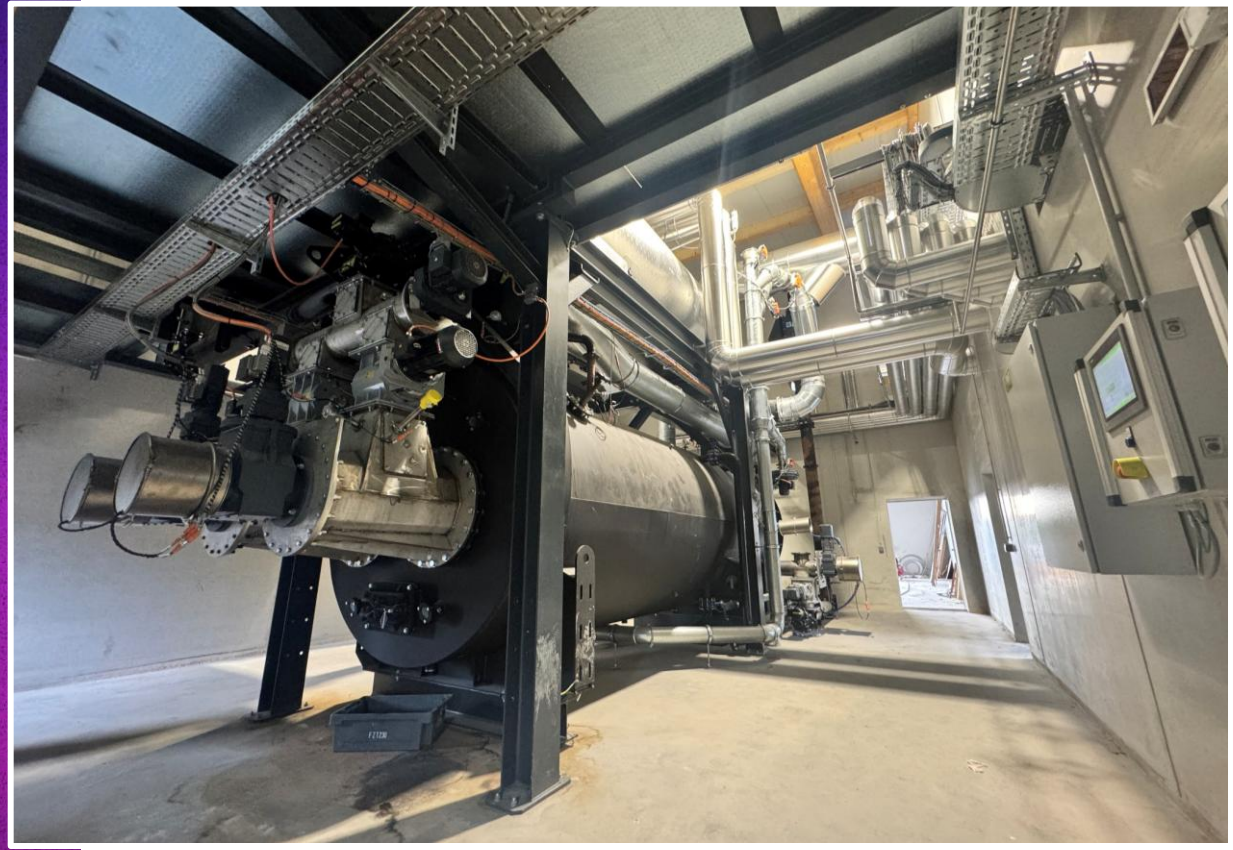
- Customer: **Fruedal**
- Equipment: **Two CF-250 Systems**
- Commissioning: **2025**
- Feedstock: **wood residues, agricultural waste and municipal waste**
- Surplus energy use: **6.75 GWh thermal, for private heating network & drying**
- Biochar production: **1,050 t/yr biochar**
  2,700 t CO_{2e}

Fruedal Energy

Biochar production & local heating – Litschau

Reference Project – Category “Medium (low)”

Austria



- Customer: **W4K GmbH**
- Equipment: **NGE T:CRACKER 5000D**
- Commissioning: **2025**
- Feedstock: **Thinning wood & forestry residues**
- Surplus energy use: **6 GWh/yr renewable heat** for the **local district heating network** (replacement of a 1 MW gas boiler)
- Biochar production: **600 t/yr biochar**
  1,600 t CO_{2e}

Combined heat & power – Möriken-Wildegg

Reference Project – Category “Large”

Switzerland

- Customer: **CN Partners (operated by Inkoh)**
- Equipment: **CTS-40 with ORC from DÜRR**
- Commissioning: **2026**
- Feedstock: **Wood residues**
- Surplus energy use: **9 GW_{th}** for **district heating** & **1.5 GW_{el} feeding into the grid**
- Biochar production: **1,600 t/yr biochar**
  4,500 t CO_{2e}

Wildfire risk mitigation – Avenal

Reference Project – Category “Large”

Portugal

- Customer: **Ibero Massa Florestal**
- Equipment: **Ibero Massa Florestal**
- Commissioning: **2024** (since 2025 certified for Carbon Removal)
- Feedstock: **Wood from landscape conservation (invasive species) → wildfire risk mitigation**
- Surplus energy use: **dry of the biomass**; **ORC system under development**
- Biochar production: **1,670 t/yr of Biochar** (from total production of 5,000 t/yr including charcoal production) corresponding to **5,000 t CO_{2e}** (capacity currently being tripled)

Carbonity – Quebec

Reference Project – Category “Industrial”

Canada

- Customer: **Carbonity**
- Equipment: **CarbonFX™**
- Commissioning: **2025**
- Feedstock: **Sawmill and forest residues**
- Surplus energy use: **enough excess energy** to **dry the biomass**, **heat the facility** and **produce bio-oil**
- Biochar production: **10.000 t/yr of Biochar** corresponding to **25,000 t CO_{2e}** (adding 20.000 t/yr biochar capacity in 2027)

BIOCHAR EUROPE

Biochar Production
has a
strong track record
of **rapid growth,**
and all the fundamentals
to **scale fast**