

Challenges in the integration and implementation of biochar projects

8. Österreichischer Biochar-Day

October 6, 2025

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Innovation, Mobility
and Infrastructure
Republic of Austria

Federal Ministry
Economy, Energy
and Tourism
Republic of Austria



For the
City of Vienna



Agenda



- Introduction to BEST
- Networkproject act4value
- Considerations and stakeholder output on integration and implementation

BEST in a nutshell

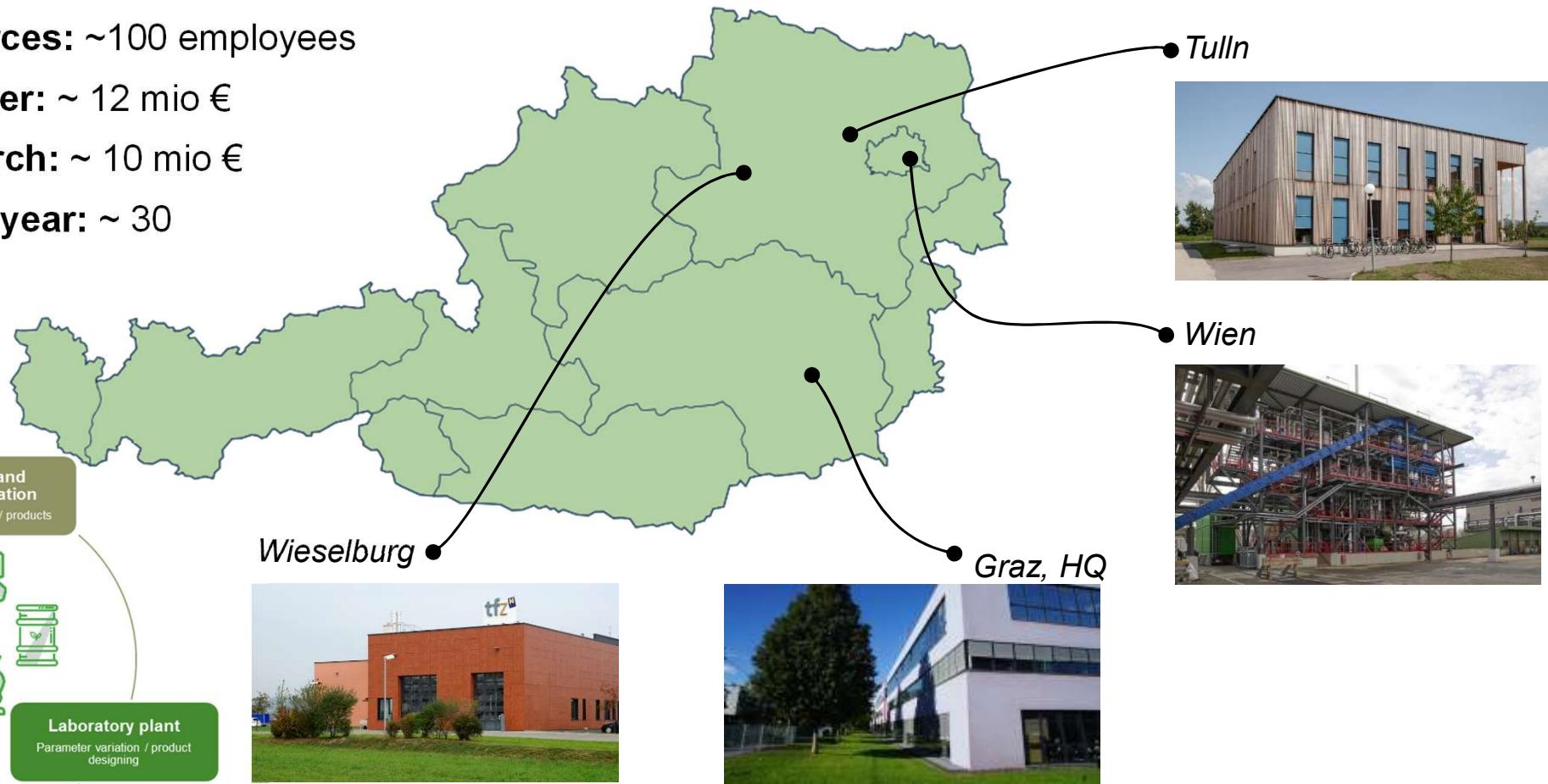


Human resources: ~100 employees

Annual turnover: ~ 12 mio €

Funded research: ~ 10 mio €

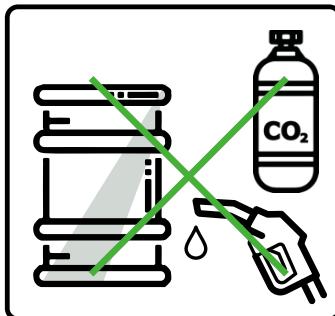
Publications / year: ~ 30





Changing the Carbon game

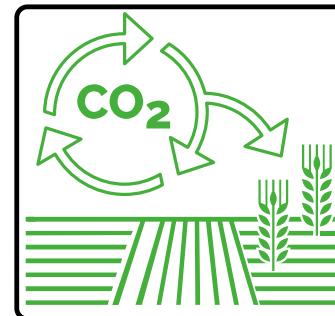
**SHAPING the TRANSITION to a SUSTAINABLE
and CLIMATE FRIENDLY CIRCULAR ECONOMY**



fossil carbon free
heat, power, gas and
transportation fuels



low value feedstock
to high value
products



CO₂-negative
technologies



economic and
efficient renewable
energy systems



Digitalization as enabling technology for competitiveness



converting biogenic residues
into value-added products

by biogas fermentation & pyrolysis

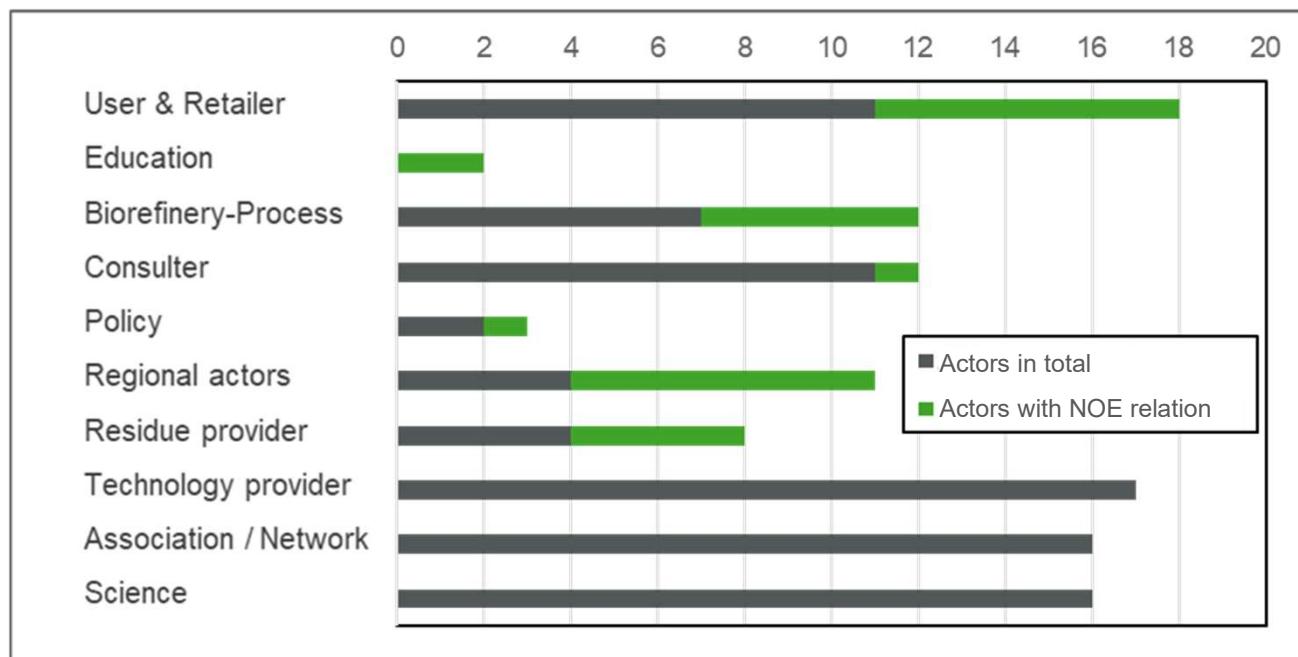


	<p>Knowledge exchange with different stakeholders Foster dialogue between research and practice Disseminate topic-relevant contents Targeted networking</p>
	<p>(Further) develop network Initiate and prepare innovative R&D-projects (A & EU) Investigate and describe value creation concepts for the utilization of biogenic residue materials Derive necessary measures to further develop such concepts</p>



GEFÖRDERT IM RAHMEN DER FTI-STRATEGIE NIEDERÖSTERREICH 2027

Gathering different perspectives and opinions... ...through interviews, workshops and conferences



Österreichischer Verein für Biomasse-Karbonisierung –
ÖBIKA

- Austrian Biomass Carbonisation Society -

+ numerous representatives
from industry & authorities



IEA Bioenergy
Technology Collaboration Programme



Verein
Kreislaufregion
Melk-Scheibbs



GREEN
TECH
VALLEY



BODEN
LEBEN

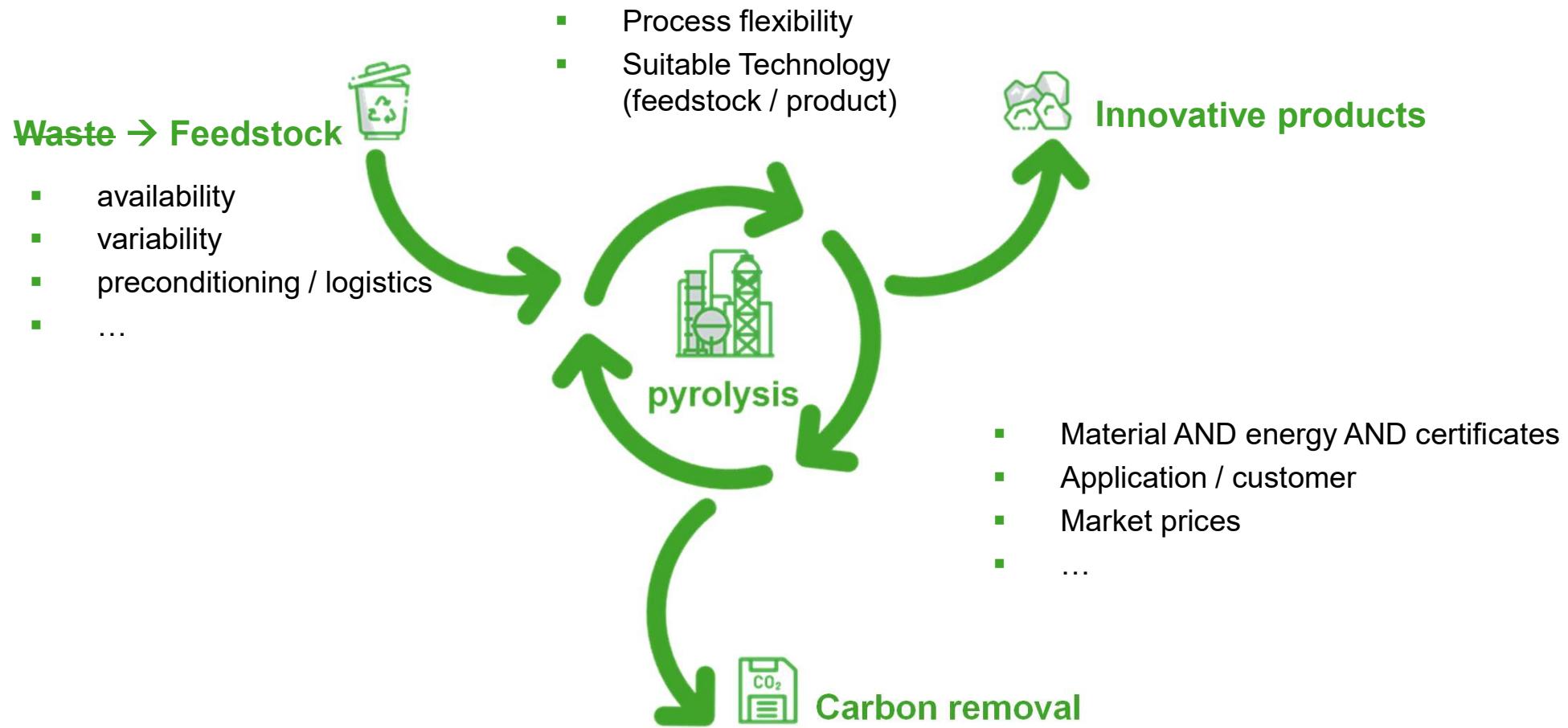


Klima- und Energie-
Modellregionen
Wir gestalten die Energiewende

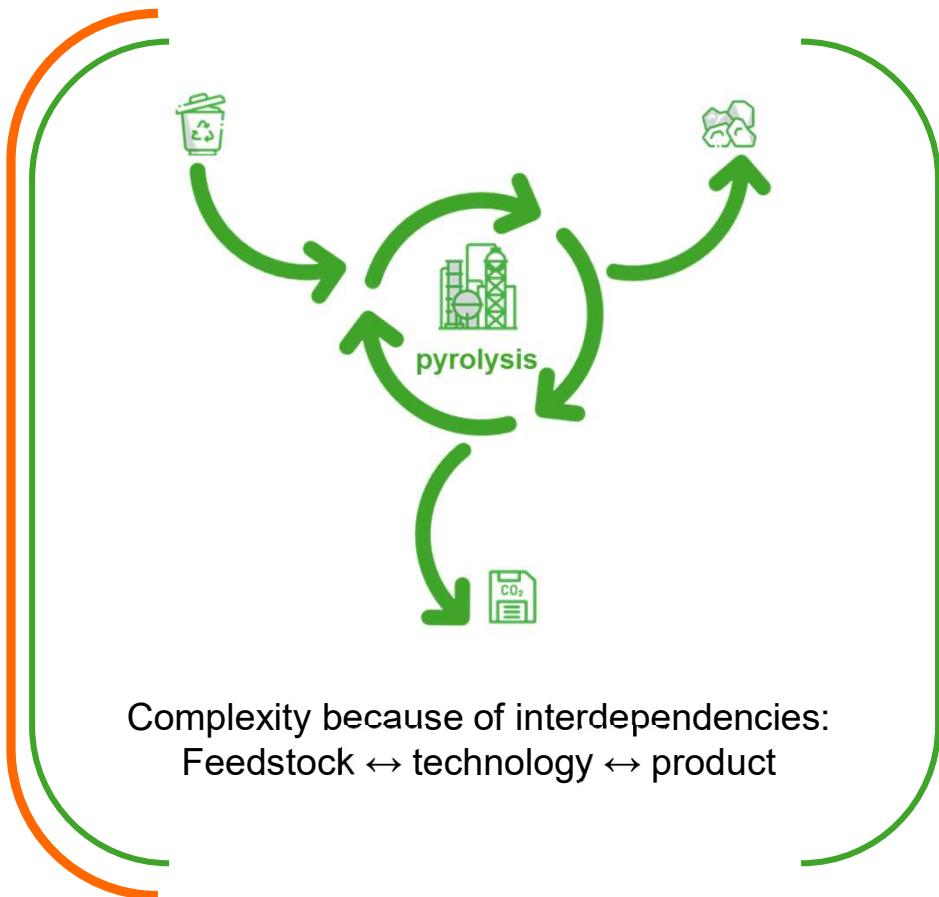
ÖSTERREICHISCHER
BIOMASSE-VERBAND



Integration – from technology to business concept



Integration – from technology to business concept



Project's main focus?

- Material / residue valorization
- Energy provision
- Product commercialization

Business concept

- Value chain?
- Number of (by) products?
- Markets?
- Partners?
- Framework (permitting procedures, legislative framework, certification, acceptance etc.)?

Production focus (1/2)



19 technologies for intermediate pyrolysis

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
biochar																			
Pyrolysis oil																			
Wood vinegar																			
Pyrolysis gas																			
Heat																			
Power																			

← Focus for developments

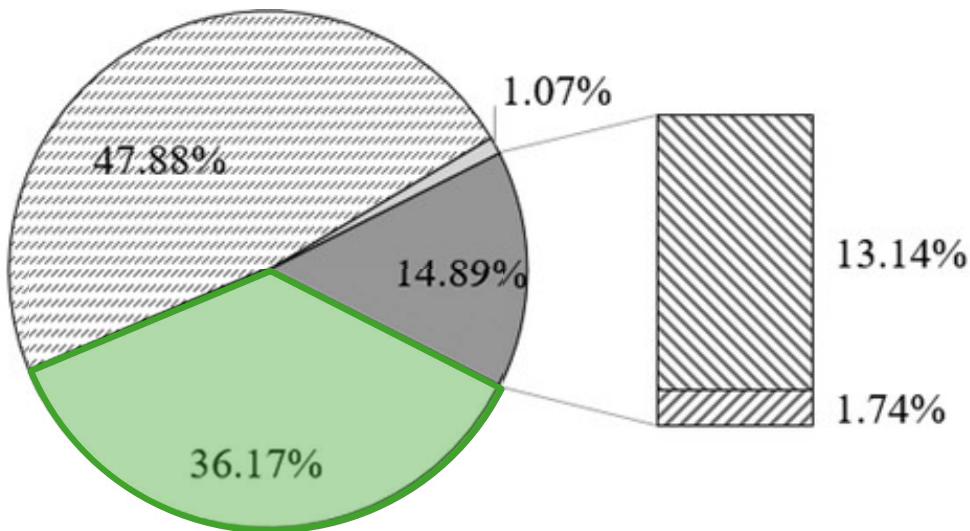
Pyrolysetechnologien in Europa:

<https://nachhaltigwirtschaften.at/de/projekte/pyrolysetechnologien-europa.php>

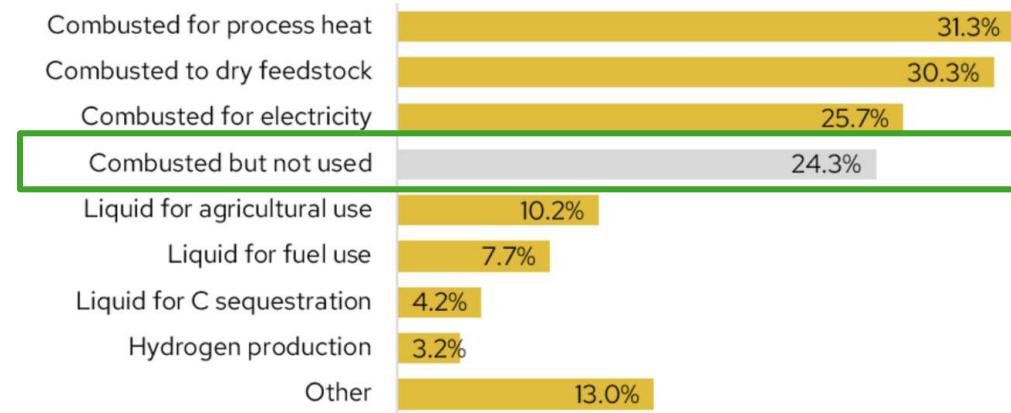
Production focus (2/2)



Energy share of pyrolysis products:



End-use of pyrolysis gas:



IBI, USBI (2024): Global Biochar Market Report, <https://biochar-international.org/wp-content/uploads/2024/06/Global-Biochar-Market-Report-2023-%E2%80%93-Public.pdf>

□ Pyrolysis gas □ Biochar □ Vinegar □ Wood tar □ Light oil

Cong et al, 2018: Slow Pyrolysis Performance and Energy Balance of Corn Stover in Continuous Pyrolysis-Based Poly-Generation Systems. <https://pubs.acs.org/doi/full/10.1021/acs.energyfuels.7b03175>

Product variety (1/2)



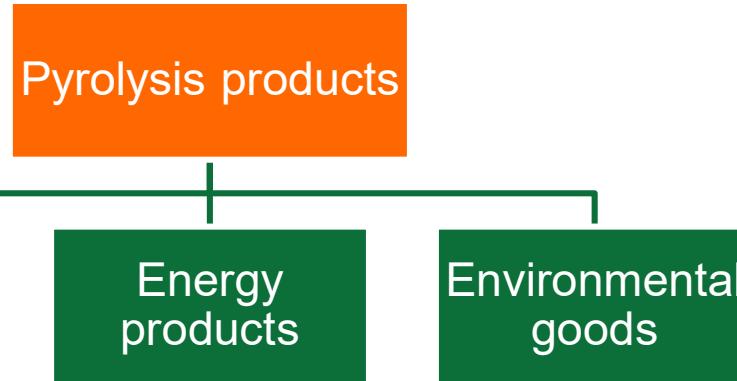
biochar



pyr.-oil



pyr.-gas



hydrogen



heat

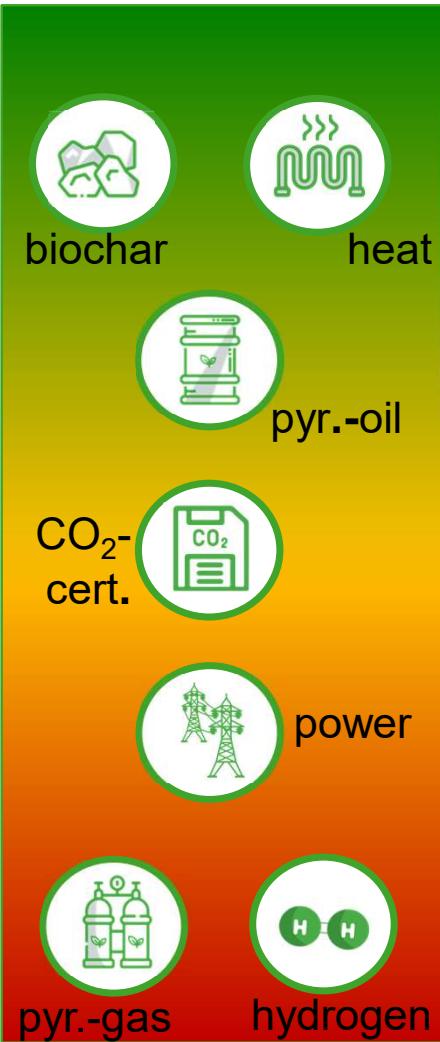


power

CO₂-
cert.



high → use of pyrolysis products



Source: www.sonnenerde.at



Source: www.char-line.com



Source: sfbiochar.com



Source: www.corigin.co



Powerchip Biochar
Source: www.guntamatic.com



T:Cracker – PyroDry
Source: www.nge.at



Rückwärtskraftwerk
Source: www.syncraft.at

Carbon Removal and Carbon Farming (CRCF) Regulation

https://climate.ec.europa.eu/eu-action/carbon-removals-and-carbon-farming_en



Source: www.carbonfuture.earth

puro • earth

Source: puro.earth/



Learnings from stakeholder knowledge exchange 2023 – 2025

Observations

- Increasing interest from industry – more product options
- Professionalization of the biochar industry (technology provider, planner, association)
- Technology often unknown to authorities and funding bodies
- Reference projects support implementation procedures

Challenges & Concerns

- Uncertain markets (products and energy)
- Economic feasibility – high invest
- Suitable business models for agriculture
- Still lack of information among certain stakeholders
- Interdisciplinarity (Information, Communication, Standards,...)



Conclusions



- Operator's **main goal must be integrated into comprehensive concepts** including feedstock availability to product marketing.
- Parallel commercialization of **material AND energy products** is crucial for economic success.
- Optimize / establish **framework conditions for product interfaces**
 - Product standards for individual applications
 - Product retailer
 - Logistic processes
- Reasonable duration for **commissioning procedures**
- Interdisciplinary network & representation for national tasks important



Österreichischer Verein für Biomasse-Karbonisierung –
ÖBIKA

- Austrian Biomass Carbonisation Society -

und



laden ein zum

Österreichischen Branchenvernetzungstreffen Biochar

25. November 2025 (nachmittags)

Reallabor Fassfabrik
Lastenstraße 19, 1230 Wien

save the date!



Ein Projekt von

M
Mischek
STRABAG
REAL ESTATE



Thank you for your attention

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WOPIENKA
Elisabeth



SEDLMAYER
Irene



SCHWABL
Manuel



KLAUSER
Franziska