Reverse is the new forward.

Renewable Energy & Negative Emission

Marcel Huber, CEO SYNCRAFT

Bio360 EXPO 2024
Jan. 24-25, 2024, Nantes

AGENDA.

SYNCRAFT®
Climate Positive Solutions.

SYNCRAFT Company

Combating Climate Change

SYNCRAFT Wood Power Plants

SYNCRAFT Technology

Valuable Forest Residues

SYNCRAFT Biochar

Let's Work Together

SYNCRAFT®
Climate Positive Solutions.

SYNCRAFT COMPANY.

COMPANY.

Facts & Figures

SYNCRAFT®
Climate Positive Solutions.

- Greentech company based in **Tyrol** / Austria
- Founded in 2009 as an **MCI university spin-off**
- Revenue 2023: **30 million euro**
- More than **50 employees** form **#teamSYNCRAFT**
- We pursue the mutual goal of **combating climate change**

COMPANY.

Business

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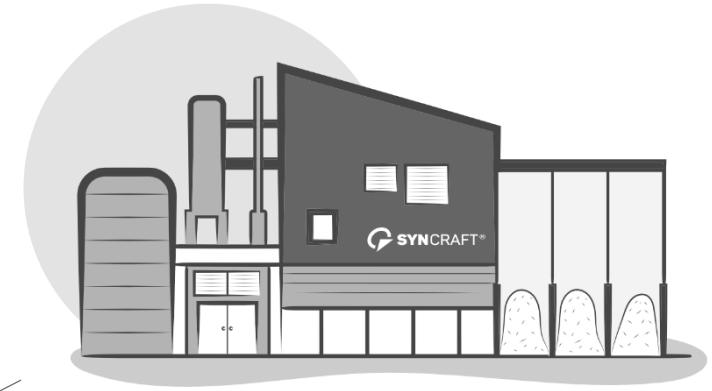
SYNCRAFT Wood Power Plants

Our power plants only use woody residues to generate bioenergy. They are featured with patented floating fixed bed technology.



Heat

Power

Biochar

COMPANY.

Mission

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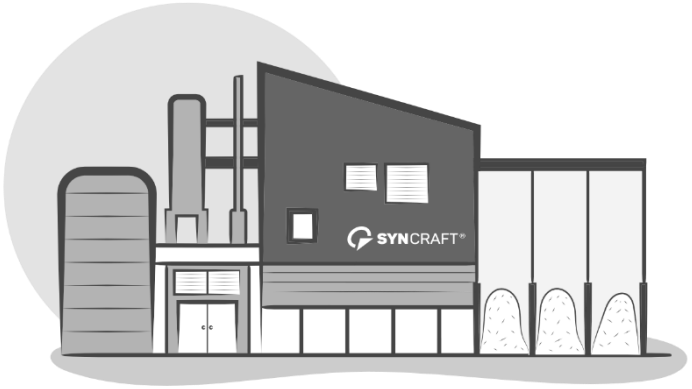
Our Mission

With our wood power plants we are one part of a big puzzle to fight against climate change and global warming.

We contribute to Carbon Dioxide Removal (CDR) by generating bioenergy and focusing on Biochar Carbon Removal (BCR).



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COMBATING CLIMATE CHANGE.

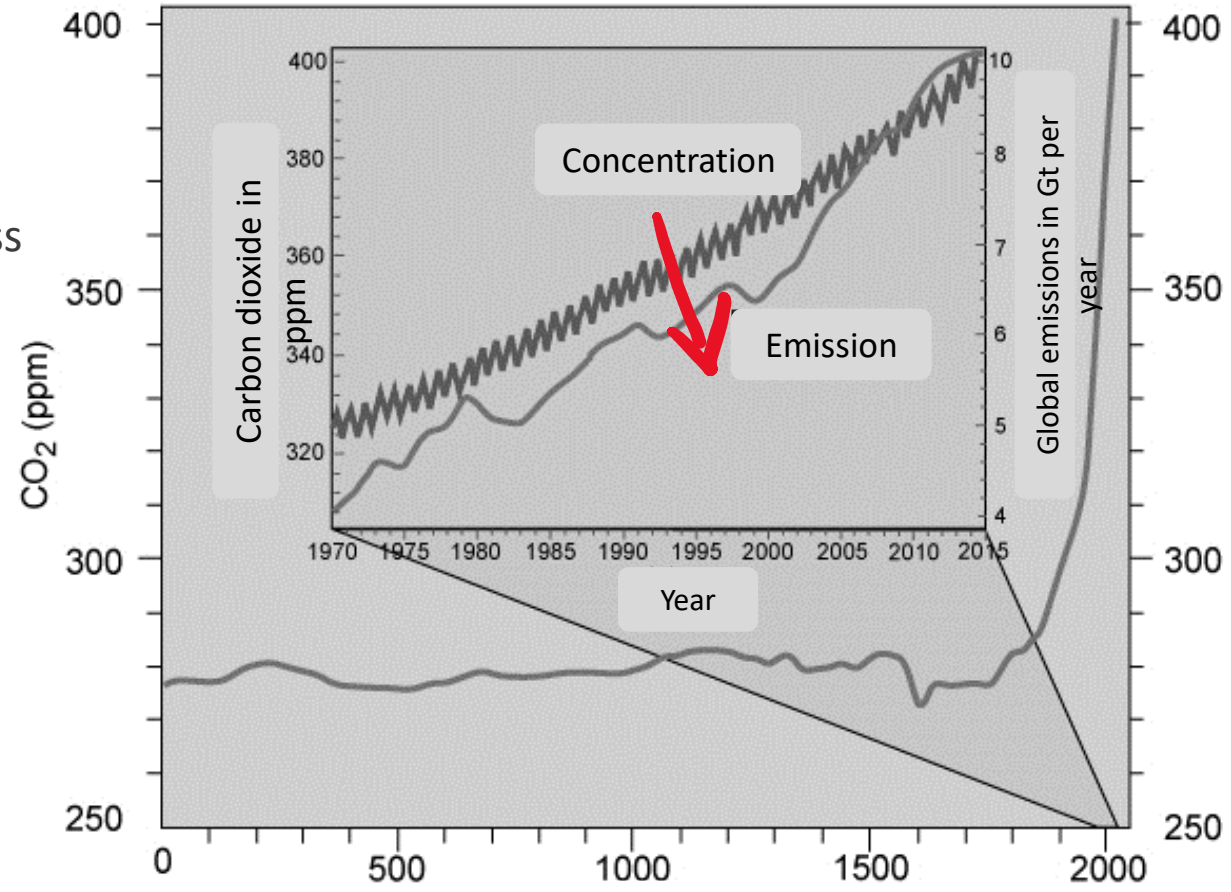
COMBATING CLIMATE CHANGE.

The problem with CO_2

- Every summer in the northern hemisphere, atmospheric CO_2 is reduced despite the 50 Gt/a anthropogenic CO_2 emission.
- If we could stop the re-release of CO_2 from biomass in winter, the increase would already be halted today.
- Our plants stabilize* and concentrate >30% biogenic CO_2 in the form of biochar, in addition to providing renewable energy.
- If we, together do that consequently and at the right scale, we can **combat climate change.**

*forever until burned

Atmospheric concentration of carbon dioxide 0 - 2015



Source: CO_2 2007.jpg – Klimawandel (bildungsserver.de)

COMBATING CLIMATE CHANGE.

The climate neutral circle

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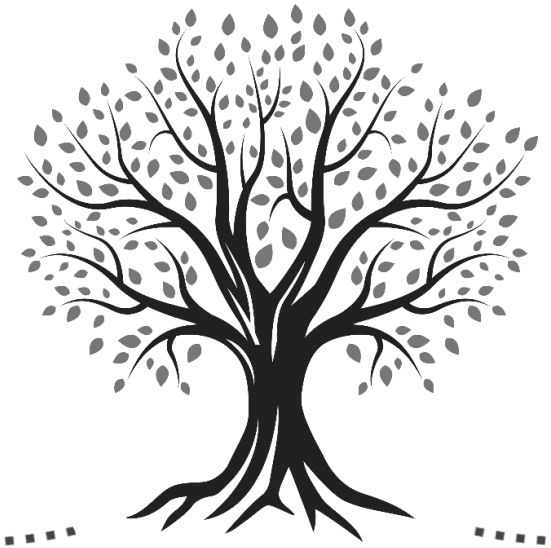
Living trees **absorb** CO_2 from the atmosphere

CO_2

CO_2

99.9 % of the CO_2 originally stored in the tree is released.



When trees die, CO_2 is **released** into the atmosphere

When trees are burned, CO_2 is **released** into the atmosphere

REVERSING CLIMATE CHANGE.

The climate positive circle

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CO_2

Only **70%** of the CO_2 originally stored in the tree is released.

SAVE*

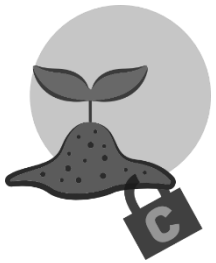
***10.000 tons CO_2 eq./a**

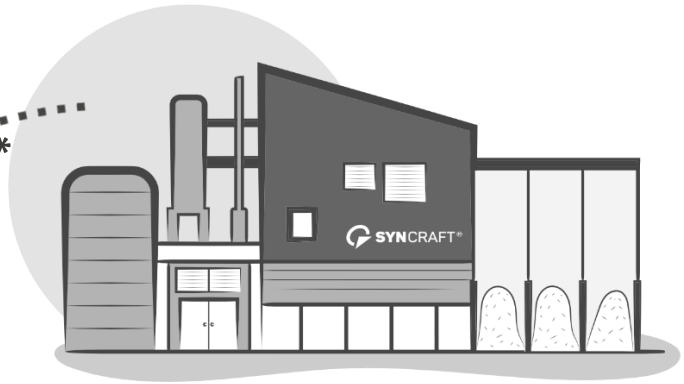
compared to natural gas

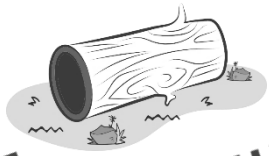
***30%**

is captured in the biochar

CAPTURED*







Reverse power plants only release part of this CO_2 for energy generation. ***A significant part is retained* as valuable, green carbon. In this way, our energy systems become ***climate positive.***

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SYNCRAFT
Wood Power Plants.

SYNCRAFT WOOD POWER PLANTS.

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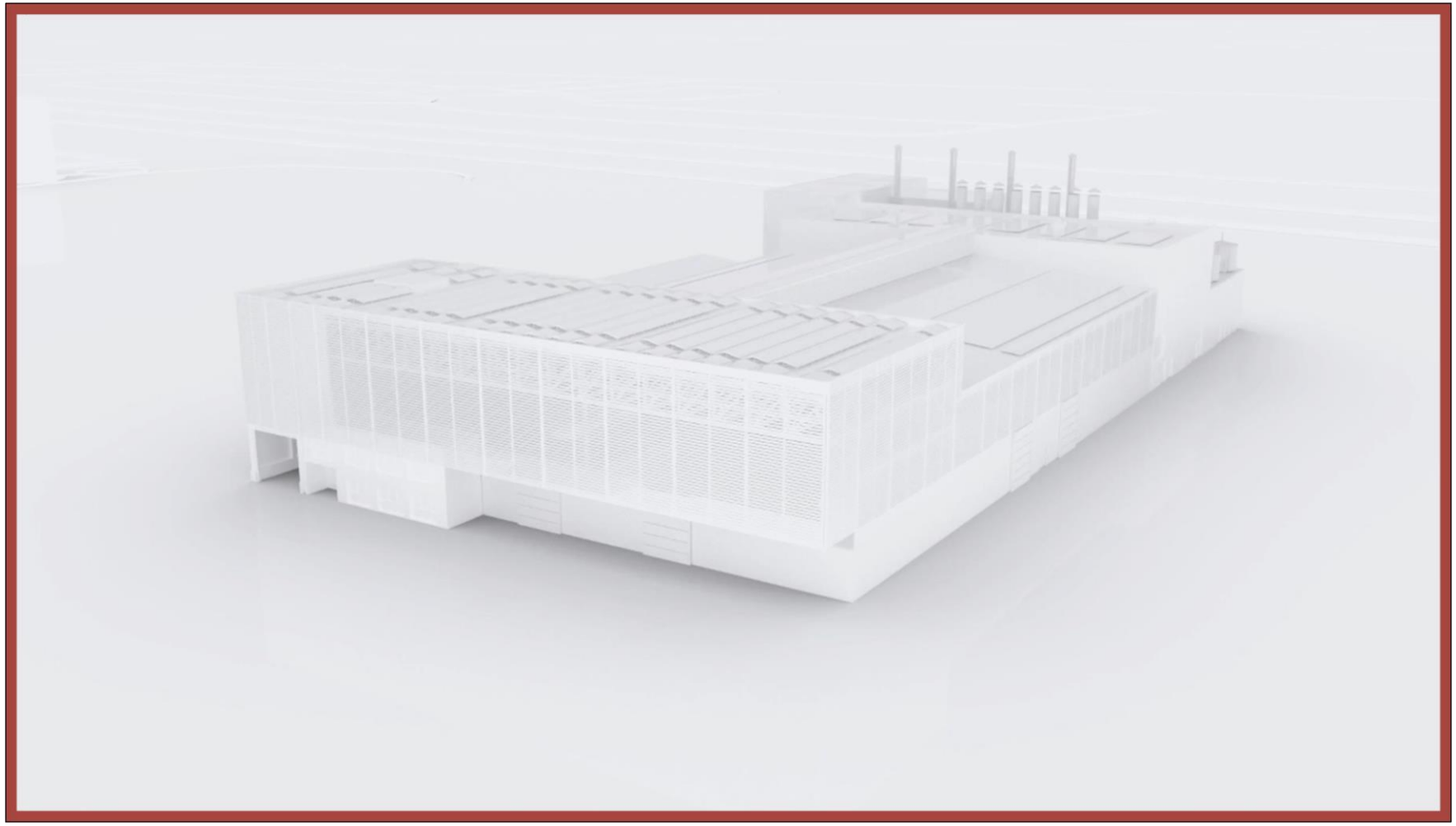

SYNCRAFT WOOD POWER PLANTS.

Why SYNCRAFT?

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- Highly innovative and **patented technology** for resource-saving and sustainable energy generation
- **Decentralized power range** between 400 – 4,000 kW
- First and unique energy systems on an industrial, commercial scale that generates climate positive power and heat in combination with the production of **EBC-certified biochar**
- Electrical efficiency comparable to **100 MW+** power plants
- Heat: power rates of **1.4**
- **No dust emissions**, no residues, no additional auxiliary materials needed

SYNCRAFT WOOD POWER PLANTS.

Perfect conditions for a SYNCRAFT power plant

SYNCRAFT®
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- **Fuel availability** (in quantity and quality)
- **Continuous usability** of products (power, heat and biochar)
- Base load coverage, continuous operation in 24/7 and ideally over **6,000 h/a** operating hours per year
- Specific space requirement of approx. **1m² /1kWel** installed capacity (gas production, storage, logistics, gas engine, dryer)
- Profitability analysis conducted under realistic conditions

SYNCRAFT WOOD POWER PLANTS.

Systems

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	CW1200-400	CW1800-500	CW1800x2-1000
Electrical power	400 kW	500 kW	1,000 kW
Thermal power 90 °C	572 kW	740 kW	1,404 kW
Thermal power ~50 °C	227 kW	250 kW	500 kW
Fuel heat capacity	1,429 kW	1,808 kW	3,527 kW
Fuel demand (dry)	286 kg/h	362 kg/h	705 kg/h
Specific fuel demand (dry)	0.71 kg/kWh el	0.72 kg/kWh el	0.71 kg/kWh el
Premium charcoal	3.5 m^3/d	4.5 m^3/d	9 m^3/d
Space required by gas generator	ca. 120 m^2	ca. 120 m^2	145 m^2
Space required by engine	ca. 55 m^2	ca. 55 m^2	65 m^2
Space required for bunker (week's supply)	278 m^3	418 m^3	480 m^3

SYNCRAFT Wood Power Plants.

References

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2023

NAWARO ENERGIE
Perg / AUSTRIA

CW1800-500 x 2
1,000kW
- 3,000 t/a CO2 eq.

NAWARO
ENERGIE

SYNCRAFT WOOD POWER PLANTS.

References

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2022

BIOENERGIE FRAUENFELD
Frauenfeld /CH

CW1800 x 2-1000x4
4 000kW
- 12 000 t/a CO2 eq.

BIOENERGIE
FRAUENFELD

SYNCRAFT WOOD POWER PLANTS.

References

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2020

FOREST ENERGY
Shingu / JAPAN

CW1800-400x4
1,600kW
- 6,000 t/a CO2 eq.

Forest Energy

SYNCRAFT Wood Power Plants.

References

2020
KWS ÖKOKRAFT
Ternitz / AUSTRIA

CW1200-400
400 kW
- 1,200 t/a CO2 eq.

SYNCRAFT WOOD POWER PLANTS.

References

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2020
TERSA
Osijek / CROATIA

CW1800-400
400 kW
- 1,200 t/a CO2 eq.

TERSA

SYNCRAFT WOOD POWER PLANTS.

References

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2019
EnergieWerk Ilg
Dornbirn Stöcken/ AUSTRIA

CW1800-500
500 kW
- 1,500 t/a CO2 eq.

EnergieWerk
Ilg GmbH

SYNCRAFT WOOD POWER PLANTS.

References

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2018

Fernheizwerk Leeg
Laas / ITALY

CW1800x2-1000
1000 kW
- 3,000 t/a CO2 eq.

SYNCRAFT TECHNOLOGY.

How does it work?

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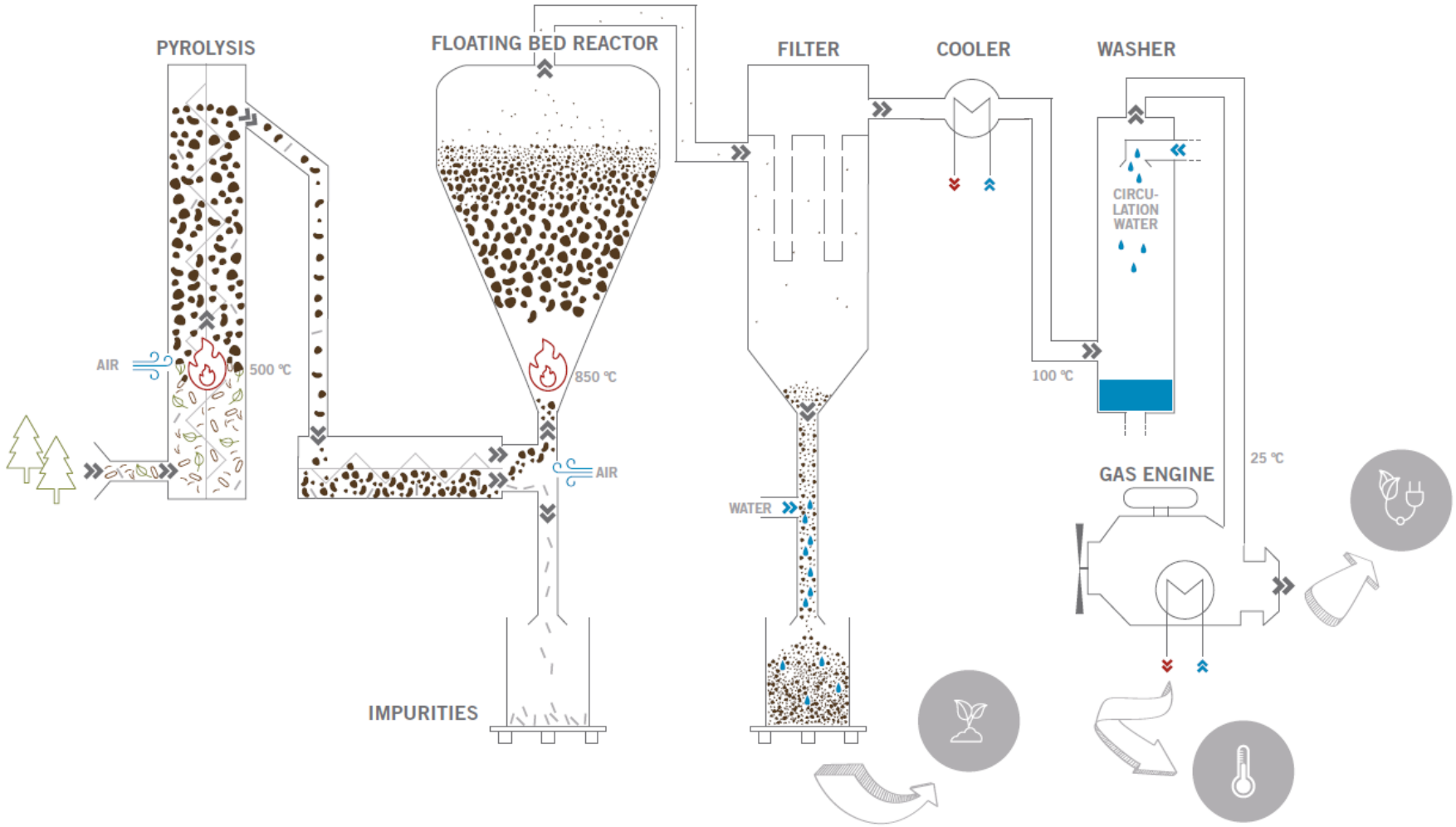
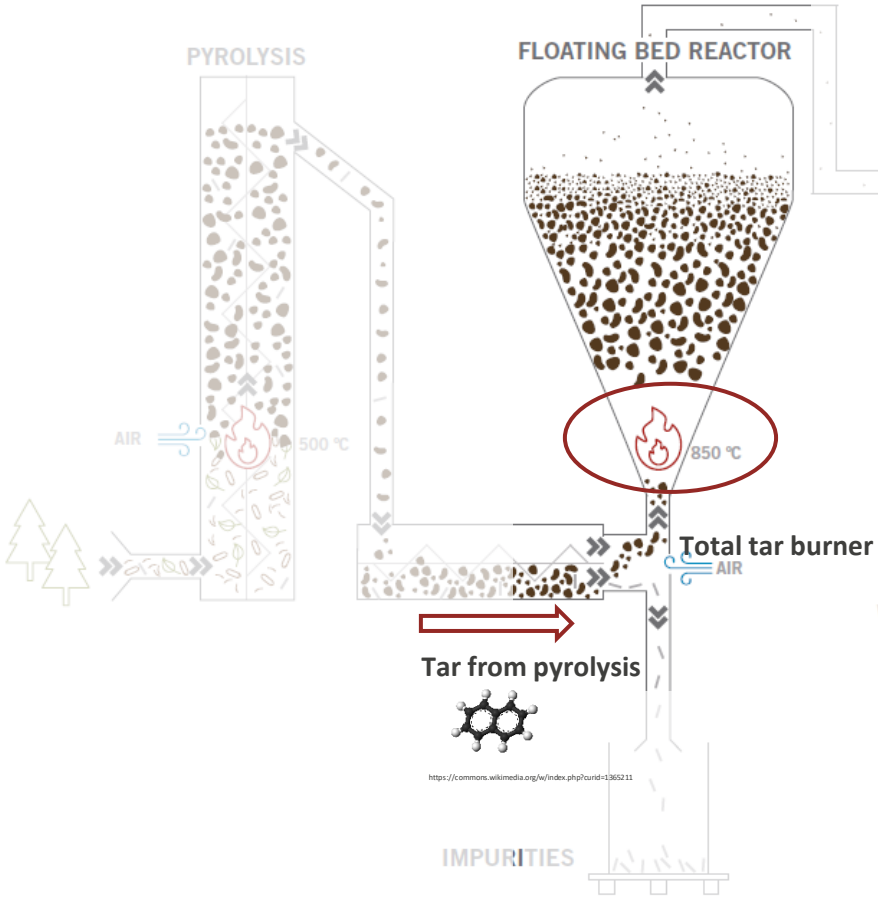


SYNCRAFT TECHNOLOGY.

Tar elimination

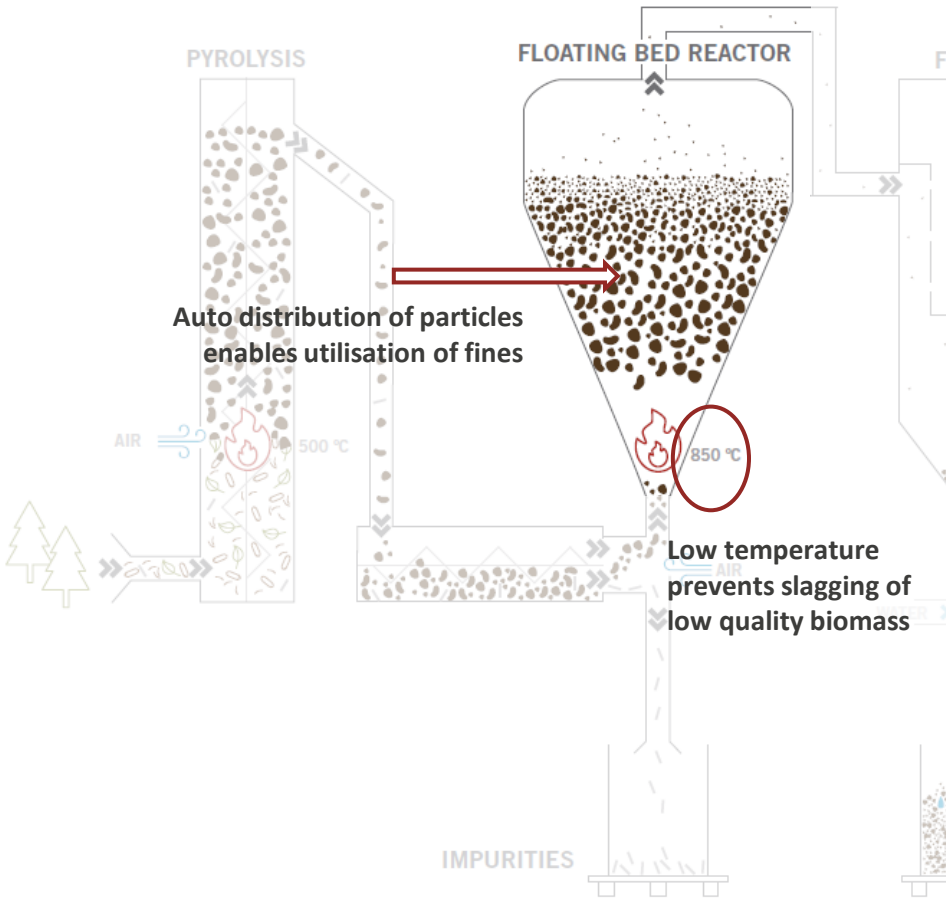


Effect 2: Blue flame directly after hotgas filter

Effect 1: Clear condensate without treatment

SYNCRAFT TECHNOLOGY.

Fuel flexibility



Low ash-melting point fraction < 1000°C

Fines from chipping; approx. 20% of weight within 1 m^3

SYNCRAFT TECHNOLOGY.

Unique floating-fixed-bed reactor

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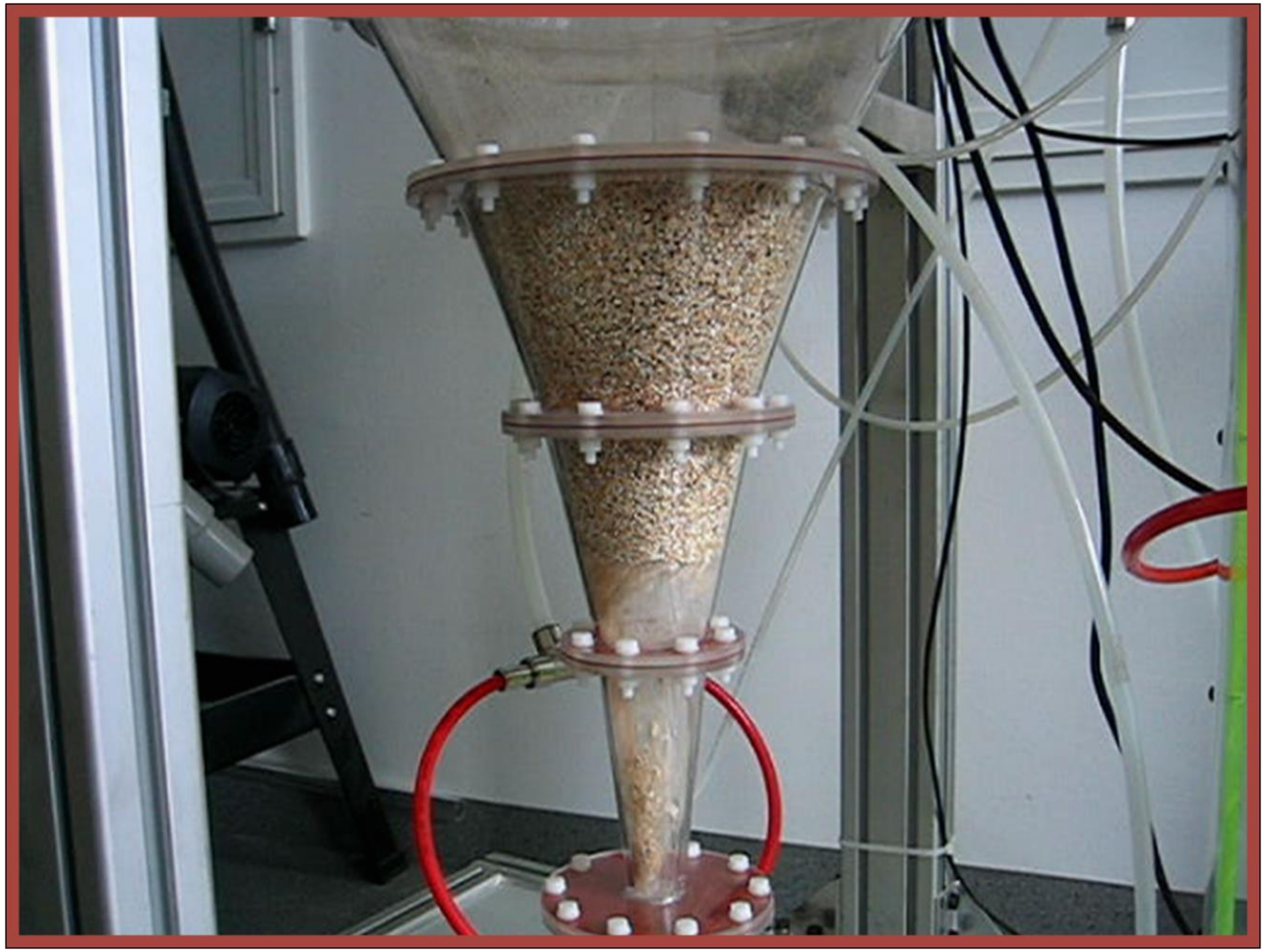

SYNCRAFT TECHNOLOGY.

Industrial design

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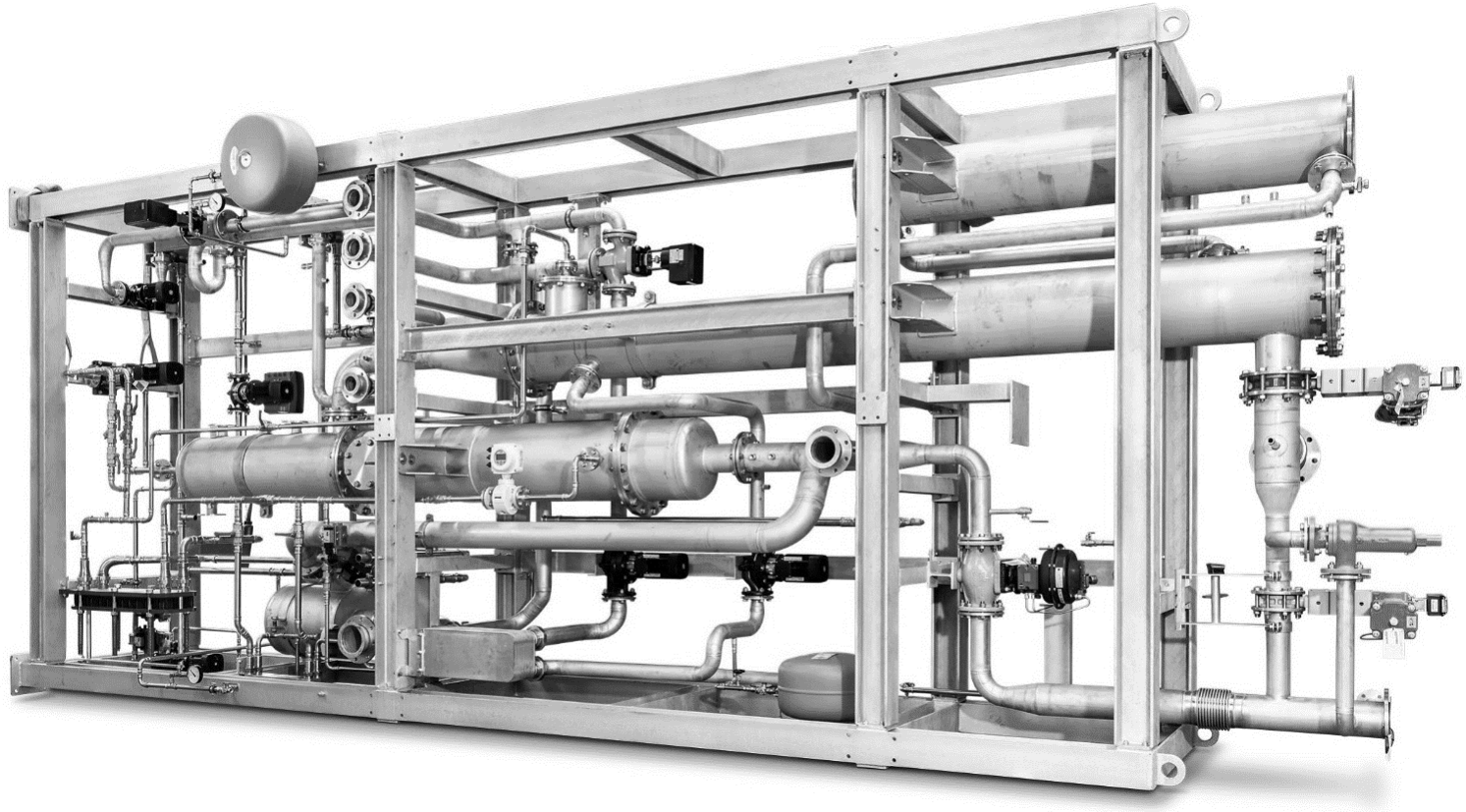

SYNCRAFT TECHNOLOGY

In combination with highly efficient wood gas engines

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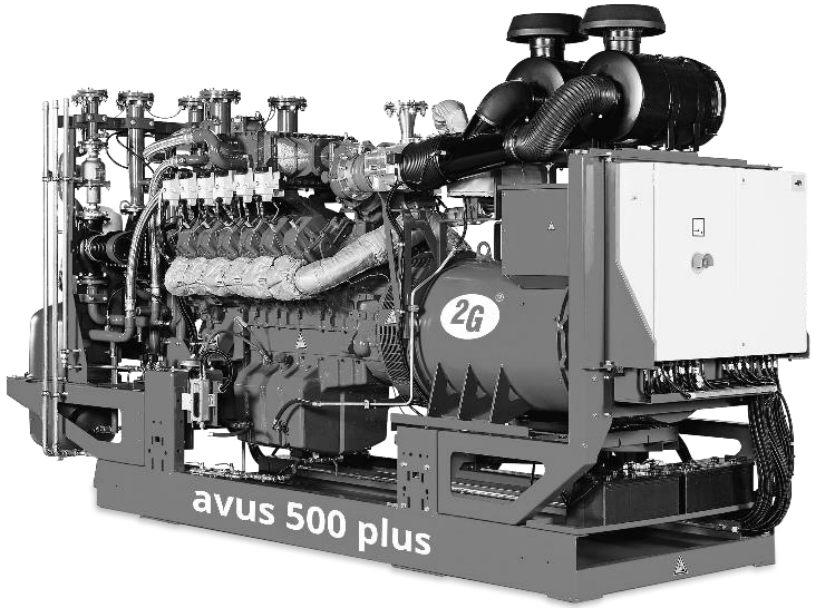
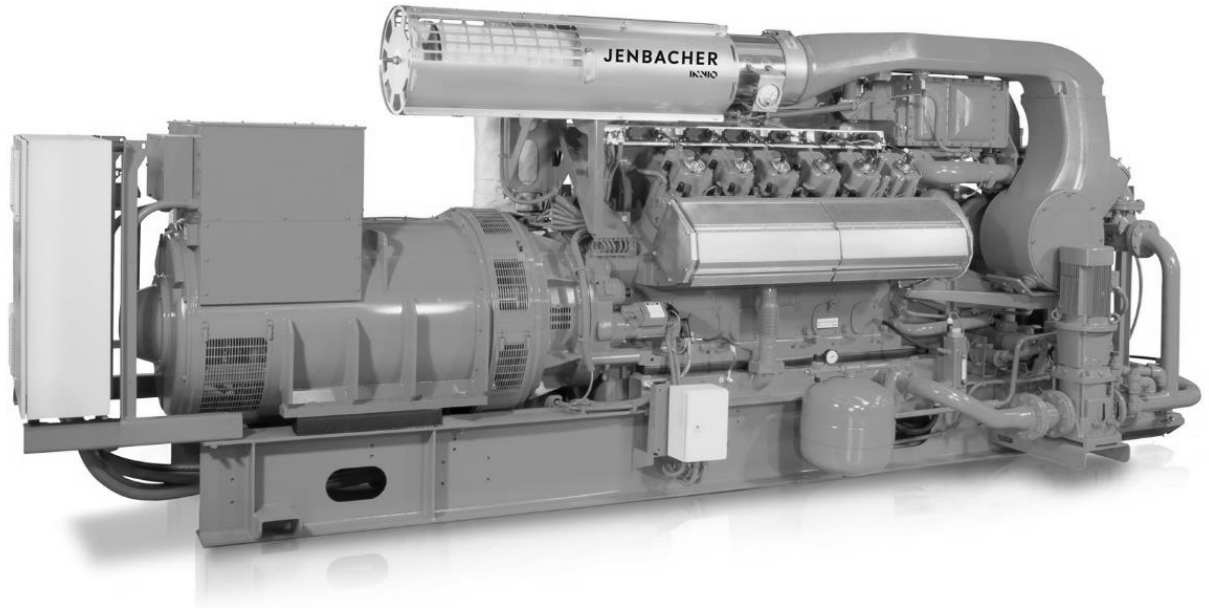
2G* engines up to 400 kW



INNIO Jenbacher* engines from 400 kW



*We are recommended by the leading gas-engine manufactures.
The engines are provided with full manufacturer warranty.

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Valuable Forest Residues

Valuable Forest Residues.

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Valuable Forest Residues.

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- Our power plants use **wood-based residues**.
  The trees are harvested for building material, furniture and other higher purposes.
- No need of using expensive wood pellets or perfect formed wood chips
- Agricultural residues are not suitable; no pellets or briquettes can be processed
- Tolerant towards stones and nails within the fuel

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SYNCRAFT BIOCHAR.

SYNCRAFT BIOCHAR.

High quality raw material

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SYNCRAFT BIOCHAR.

High quality raw material

SYNCRAFT®
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SYNCRAFT Biochar

Biochar generated by our power plants is certified, of high quality, rich in carbon, free of impurities, **inert**.

Soil Additive

Feed Additive

New BCR Applications

SYNCRAFT BIOCHAR.

Carbon Sink Ecosystem

SYNCRAFT®
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From the cradle to the sink.
Our carbon sink ecosystem is fully developed and is already providing our customers with ongoing and reliable additional income.

Certified by:
(Carbon & Sink)
EBC
CARBON STANDARDS international

Tracked by:
(via Blockchain)
Carbonfuture

Supported by:
(Association)
EBI European Biochar Industry

SYNCRAFT Reverse Power Plant

Approved by:
ipcc
INTERGOVERNMENTAL PANEL ON climate change
Nature based solution
#BioChar

Retailers / Refiners

Traded by:
ALPENKOHLE
NATÜRLICH • REGIONAL • NACHHALTIG
CARBUNA
CarStorCon® Technologies
Nature Based Solutions
SIOTUU CO2 SOLUTIONS GROUP

Customers

Certificate Traders

Traded by:
Carbonfuture
First Climate
south pole
puro.earth

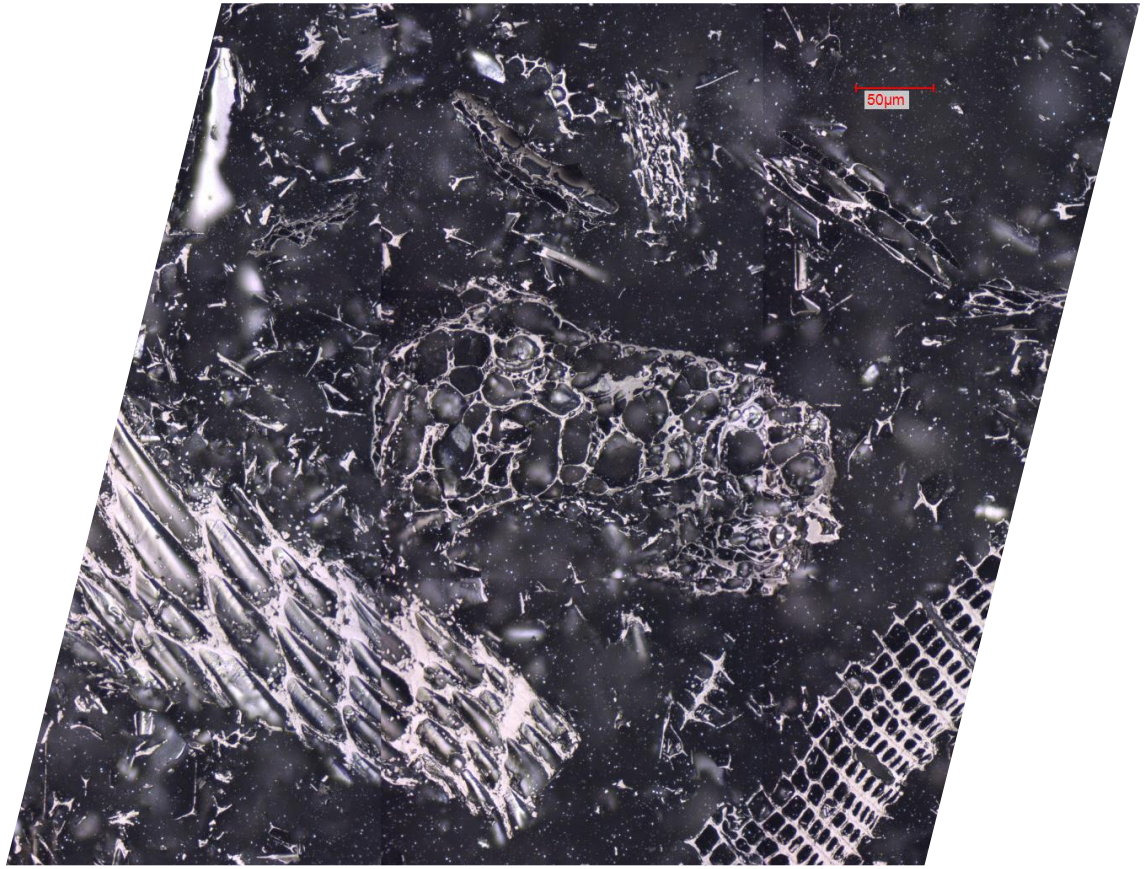
Certificate Customers

Purchased by:
shopify
Microsoft
BlackRock.
SWAROVSKI

SYNCRAFT BIOCHAR.

Inertinite

- **Inertinite** is carbon found in the lithosphere of earth's crust.
- It has been derived from biomass over ages and describes carbon at its most stable form.
- Organic geochemists determine its maturity (inertness) of organic carbon by measuring its reflectance (more reflective = more structured/aromatic = more inert). At a reflectance of 2%, these carbons are considered chemically inert (geologically stable).
- With an average reflectance of almost **4%, SYNCRAFT generated biochar** is among the most stable forms of carbon currently existing.



Let's Work Together

37
~~32~~
Energy systems worldwide

17,4 MW
~~11,45 MW~~
Electric power generated

92 %
~~90,2 %~~
Plant utilization

123kt
~~81,296 t~~
CO_2 captured