

PROPERTIES OF BIOCHAR & PRODUCTION TECHNIQUE



In Association with SVCH-Technologii, Moscow (Russia)

ISO 9001:2015 | ISO 14001:2015 | ISO 45001:2018

ABOUT US

KERONE is now renowned for serving the specialized needs of customers with the best quality and economical process of Heating /cooling and drying products, manufactured in a high-quality environment by a trained and qualified workforce (special purpose machinery)

-  48+ Years Manufacturing Excellence
-  Great Sale Support
-  Highly Customized Product
-  Adherence to Standards
-  Sound Infrastructure
-  Team of experts Delivering Quality
-  Timely Delivery
-  Cost Effective Solutions



KERONE is a pioneer in application and implementation engineering with its vast experience and team of professionals.



KERONE is devoteded to serve the industry to optimize its operations both economically and environmentally with its specialized heating and drying solutions.



KERONE is having immense expertise in manufacturing and implementing various types of engineering solutions.



KERONE is possessing employee strength of more than 280+ experts continuously putting efforts for happy industrial engineering solutions.

WHY CHOOSE US

With decades of expertise, cutting-edge technology, and a customer-centric approach, Kerone Engineering offers tailor-made heating solutions that prioritize quality, flexibility, and cost-effectiveness. Benefit from our commitment to excellence, post-sales support, and innovative solutions for your unique heating needs. Choose Kerone Engineering for reliability, performance, and unmatched value.

MISSION

- ✓ To enhance the value of customer operation through our customer need centric engineering solution
- ✓ We are committed to provide our customers, unique and best in class products in Industrial heating drying and cooling segment with strategic tie-up for the technical know-how with renowned leader in the industry specific segment

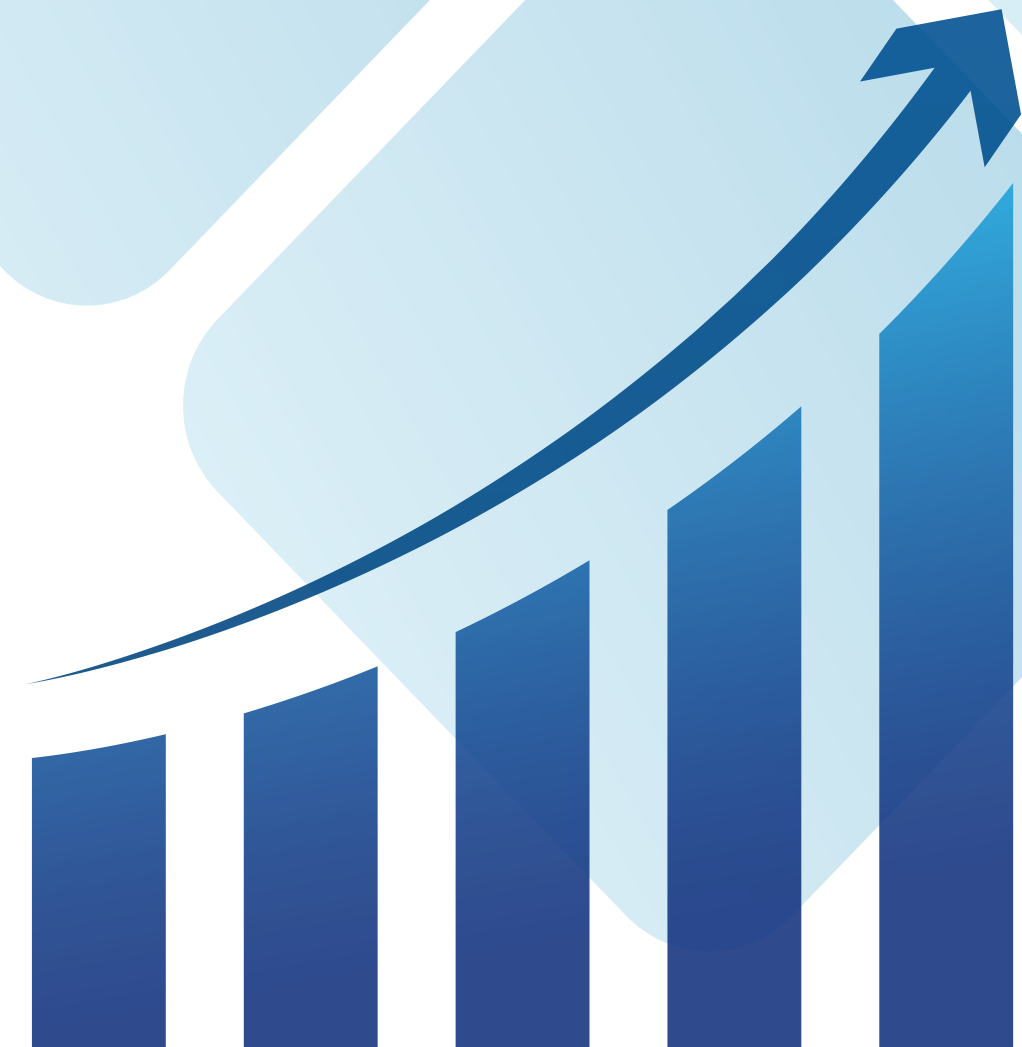
VISION

- ✓ Turn into a world leader in providing specialized, top-notch quality and ecological industrial heating, cooling, and drying solutions across the globe.
- ✓ To attain global recognition as the best of quality and environment-friendly engineering solution company.

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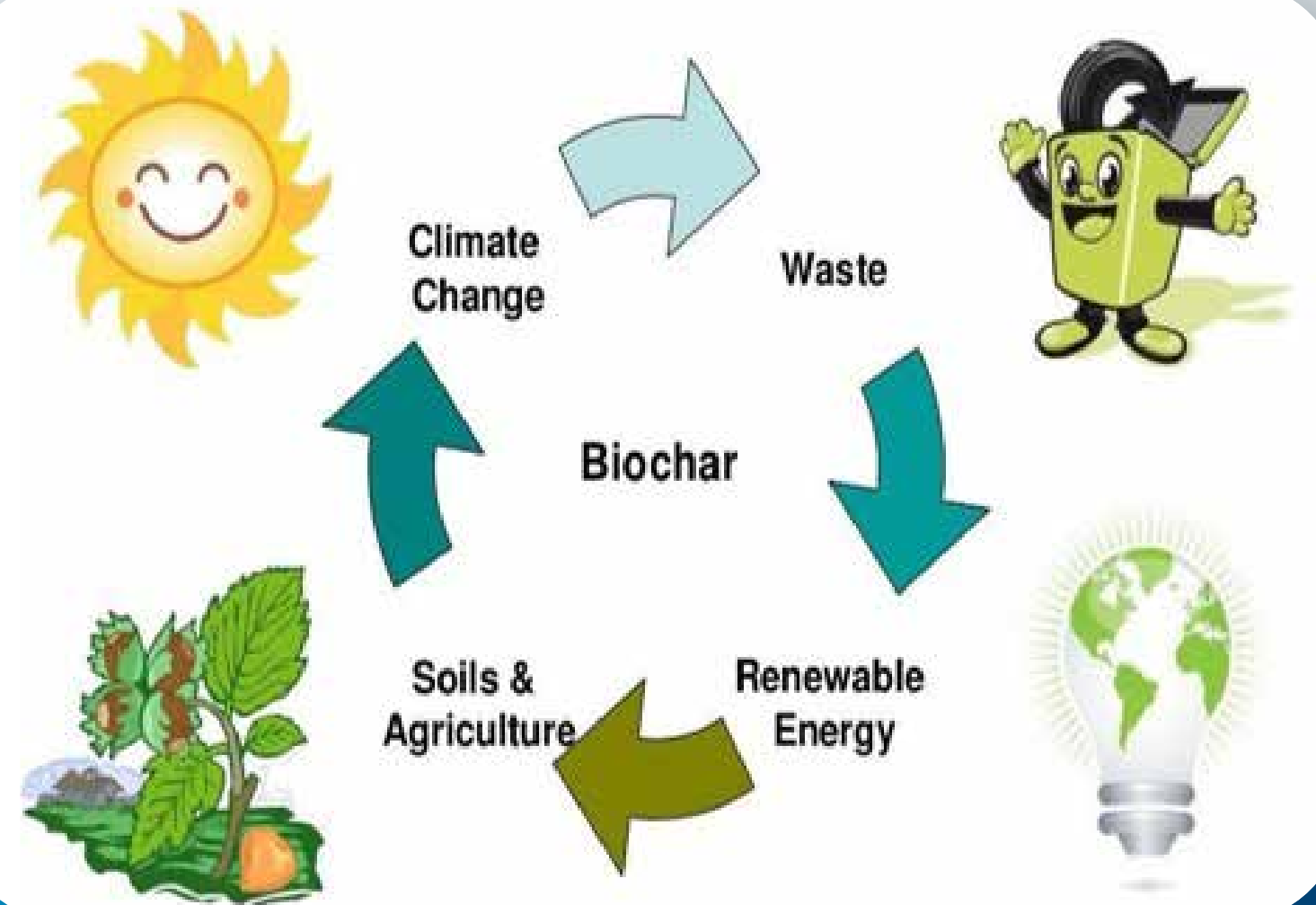
Enhance the value of customer operation through our customer need centric engineering solution.

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What is Biochar?

Biochar is a form of charcoal that is produced from organic materials such as wood, agricultural waste, and other biomass, through a process called pyrolysis. Pyrolysis is the heating of the organic material in a low oxygen environment to temperatures between 350 and 700 degrees Celsius. This process breaks down the organic material and leaves behind a stable, carbon-rich substance called biochar. Biochar has garnered attention for its potential environmental benefits, particularly in soil management and climate change mitigation. When added to soil, biochar improves its structure, water retention, and nutrient absorption. It also provides a long-term carbon sink, as it sequesters carbon dioxide that would otherwise return to the atmosphere, making it an effective tool in carbon capture strategies.



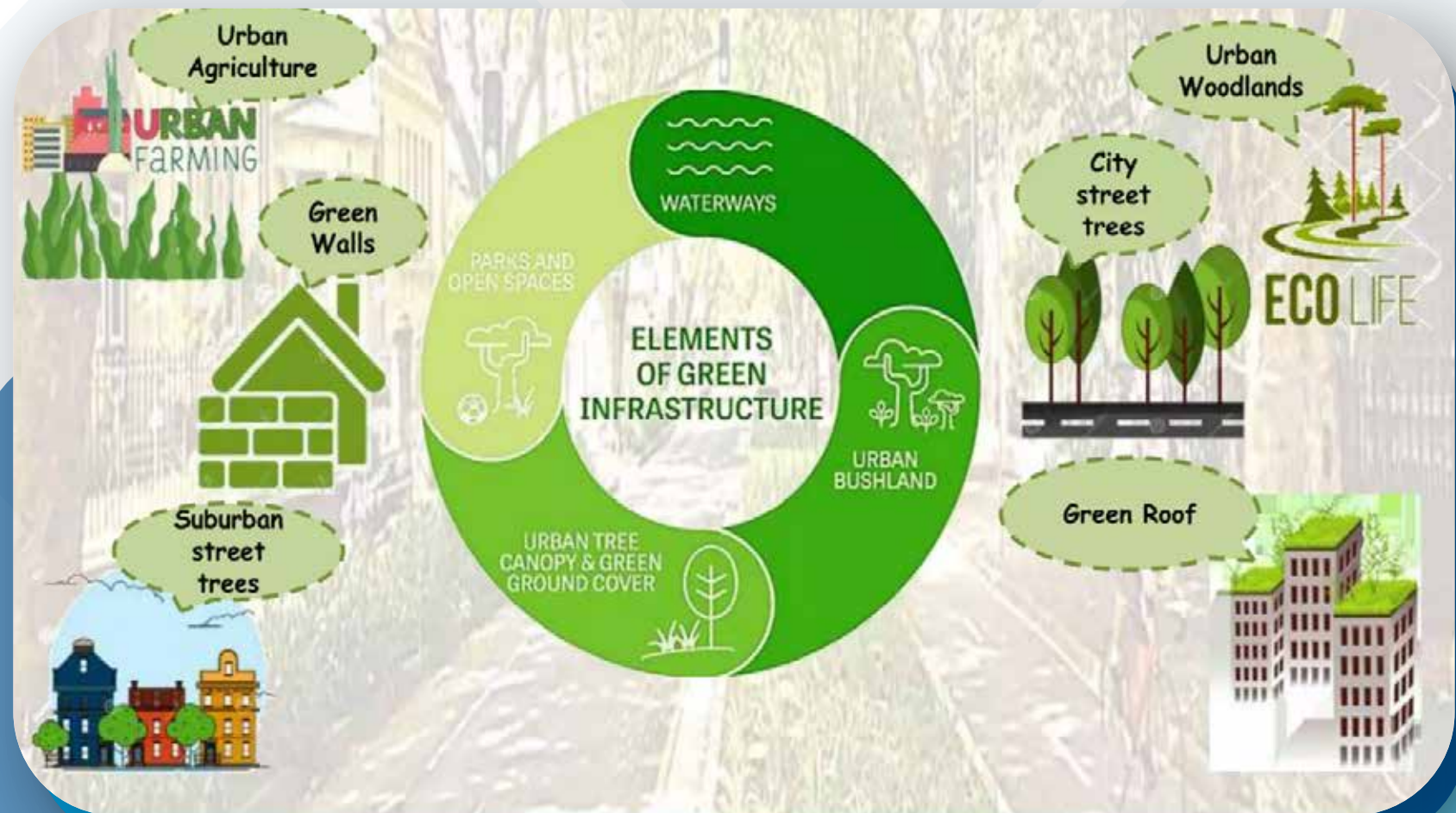
Importance of Biochar

Waste reduction

Biochar can be made from a variety of organic waste materials, such as crop residues, wood chips, and animal waste. By converting these waste materials into a valuable soil amendment, we can reduce waste and improve soil health at the same time.

Renewable energy

The process of producing biochar can also produce renewable energy, through the use of waste heat and syngas. This can help reduce reliance on fossil fuels and promote a more sustainable energy system.



Biochar Carbon Cycle

Production

Biochar is produced by heating organic materials, such as wood, agricultural waste, or animal manure, in a low-oxygen environment. This process, called pyrolysis, breaks down the organic material and leaves behind a stable, carbon-rich substance.

Application

Once produced, biochar can be applied to soil as a soil amendment. The biochar helps to improve soil fertility, water retention, and nutrient availability, while also sequestering carbon in the soil.

Soil storage

Once applied to soil, the biochar can remain in the soil for hundreds or even thousands of years, effectively storing carbon that would otherwise be in the atmosphere.

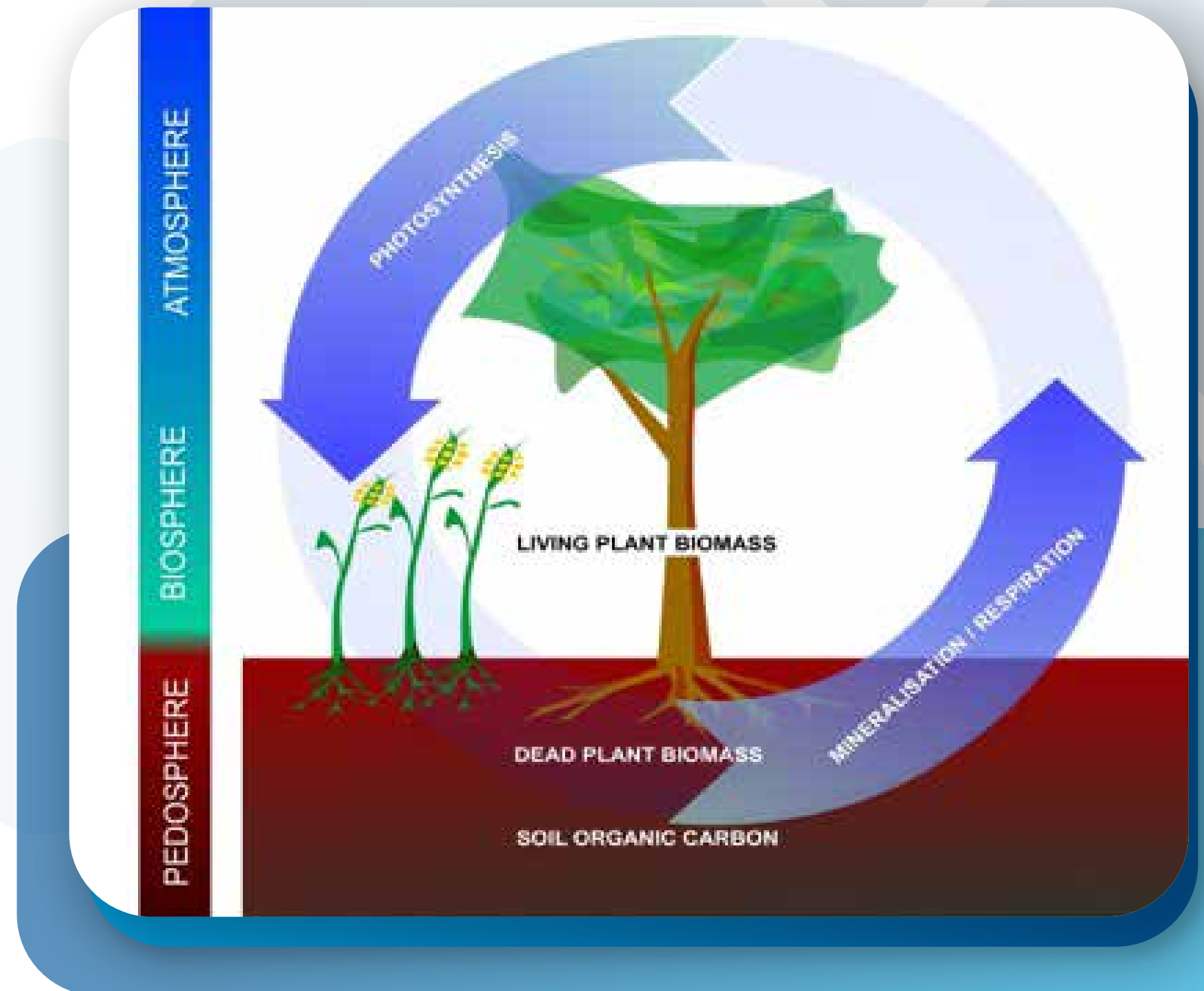
Biochar Carbon Cycle

Decay

Over time, some of the carbon in the biochar may be released back into the atmosphere through decay or erosion. However, because biochar is a stable form of carbon, it is much less likely to decompose than other organic matter in the soil.

Carbon offset

The carbon that is stored in the soil as biochar can be considered a carbon offset, because it represents carbon that has been removed from the atmosphere and stored in a stable form in the soil. This can help to mitigate the effects of climate change by reducing the amount of carbon dioxide in the atmosphere.



Thermal Conversion of Biomass

Combustion

Combustion is the most common method of thermal conversion of biomass, and involves the burning of biomass to generate heat and electricity. In this process, biomass is burned in a furnace or boiler, and the heat generated is used to produce steam, which in turn drives a turbine to generate electricity.

Pyrolysis

Pyrolysis is the process of heating biomass in the absence of oxygen to produce bio-oil, char, and gases. The bio-oil can be used as a fuel or feedstock for the production of chemicals, while the char can be used as a soil amendment or for carbon sequestration. The gases can be used for energy production or as a feedstock for the production of chemicals.

Gasification

Gasification is the process of heating biomass in the presence of a limited amount of oxygen to produce a gas mixture called syngas. Syngas can be used as a fuel for heating or electricity generation, or as a feedstock for the production of chemicals.

Biomass
- manure
- organic wastes
- bioenergy crops (grasses, willows)
- crop residues



(C) 100%

(C) 50%

Returned to soil as biochar

Pyrolysis

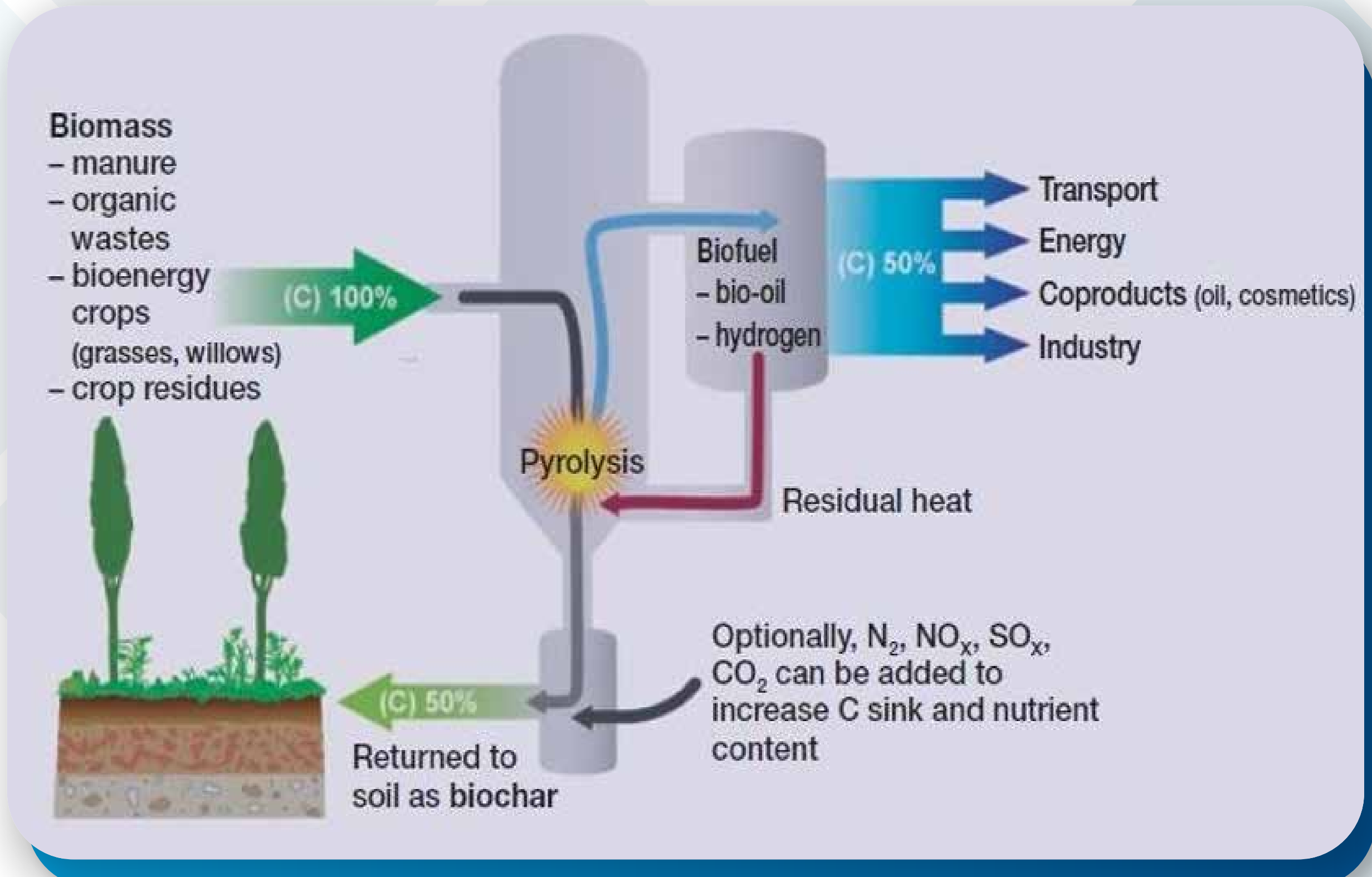
Biofuel
- bio-oil
- hydrogen

(C) 50%

Residual heat

Optionally, N_2 , NO_x , SO_x , CO_2 can be added to increase C sink and nutrient content

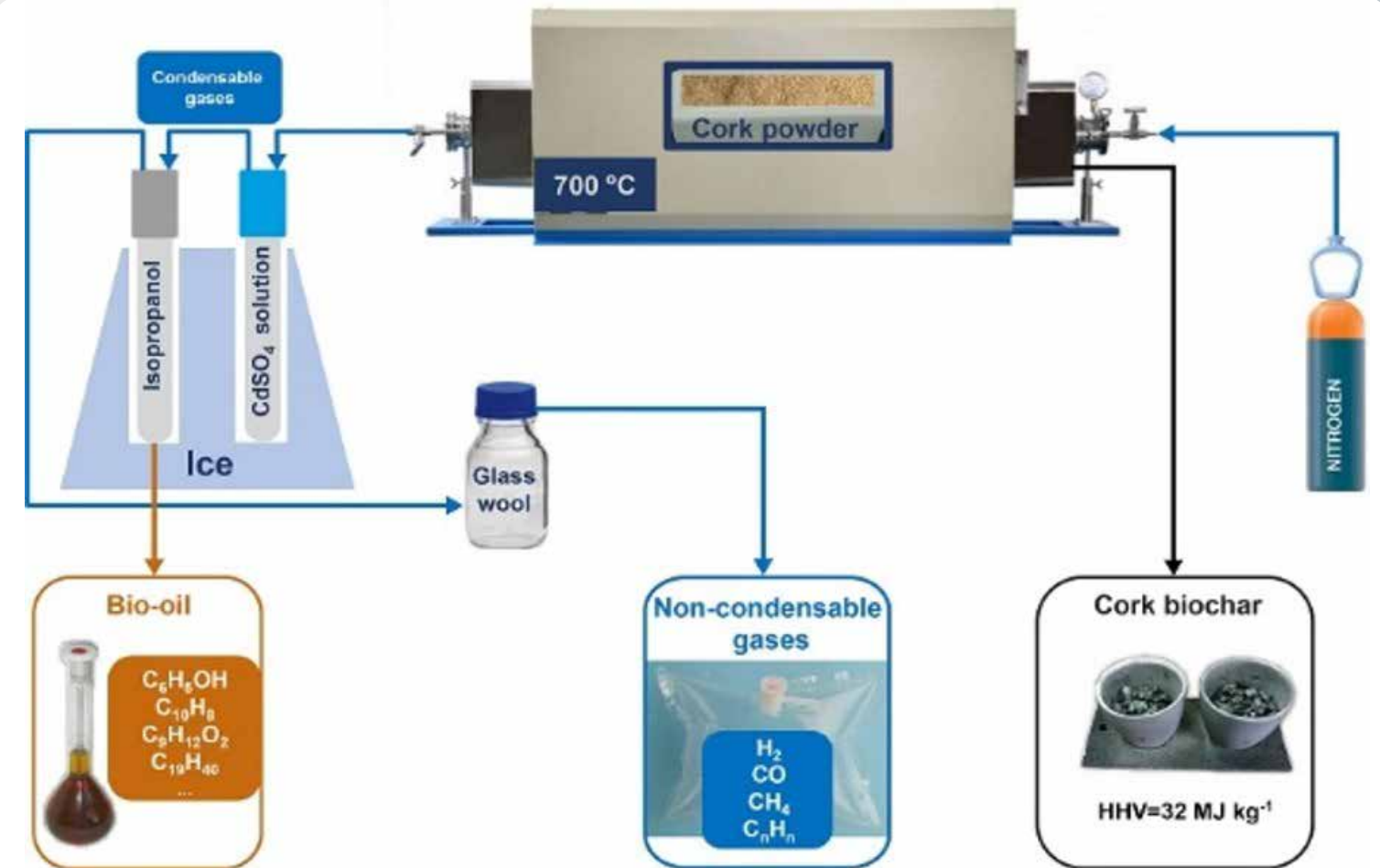
Transport
Energy
Coproducts (oil, cosmetics)
Industry



Techniques for Biochar production

Slow pyrolysis

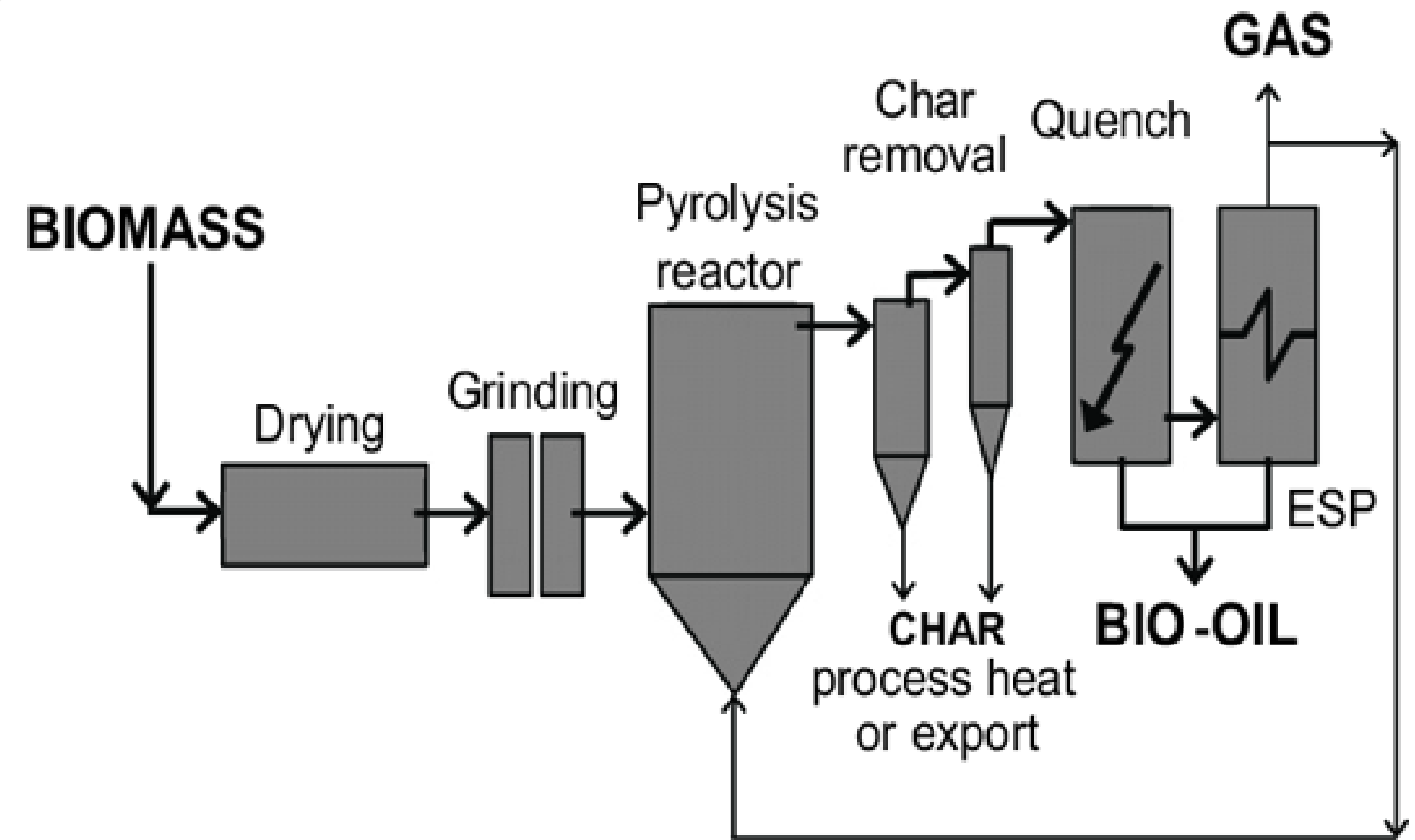
This is a low-temperature pyrolysis process that takes place at temperatures between 400 and 700°C, typically in the absence of oxygen. The process produces biochar with a high carbon content and can also generate bio-oil and gas as byproducts. Slow pyrolysis is a commonly used technique for biochar production in the industry.



Techniques for Biochar production

Fast pyrolysis

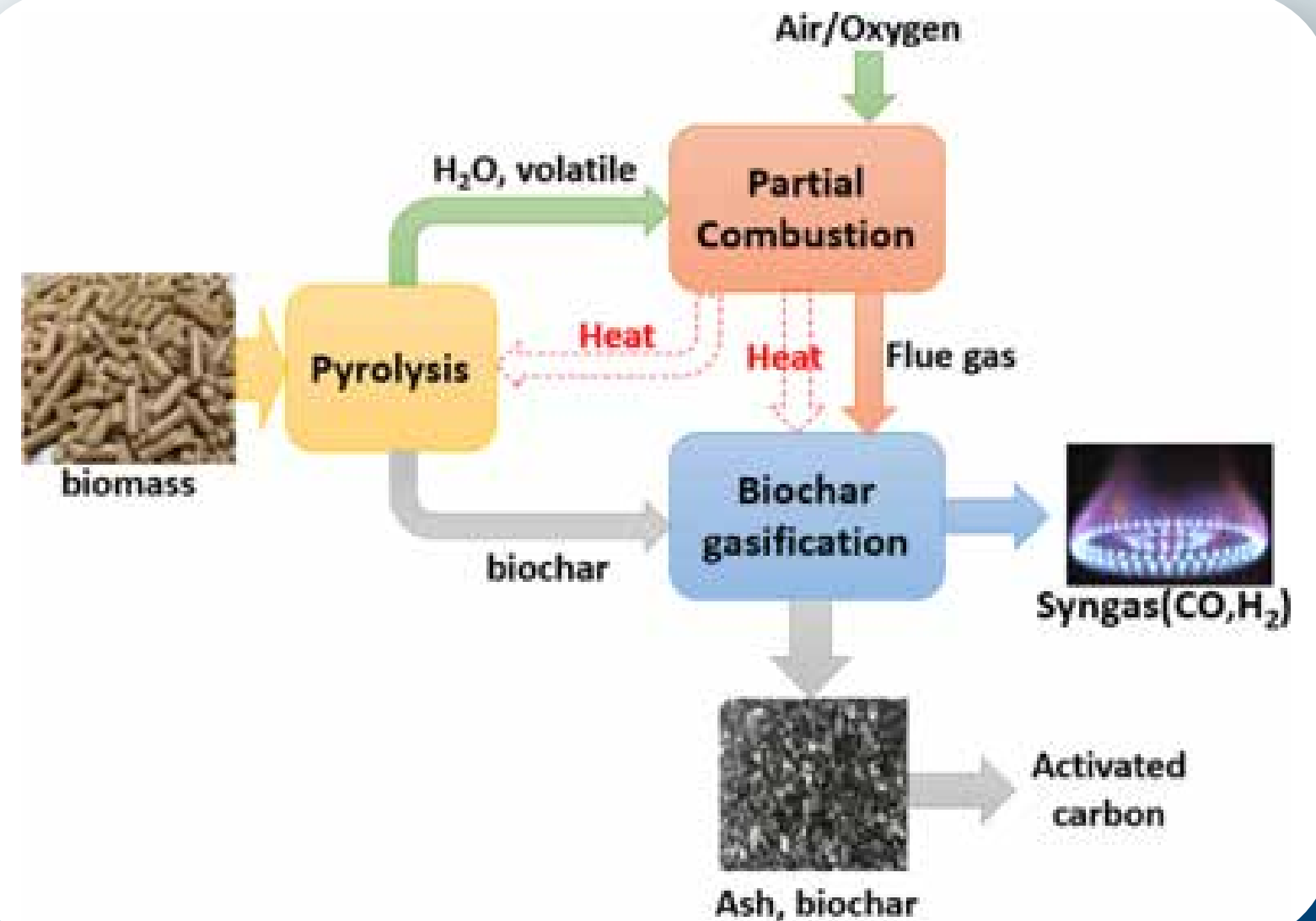
This is a high-temperature pyrolysis process that takes place at temperatures between 500 and 800°C, typically in the absence of oxygen. The process produces a higher yield of bio-oil as the primary product, and smaller amounts of biochar and gas as byproducts. Fast pyrolysis is a rapid process and can be used to produce biochar on an industrial scale.



Techniques for Biochar production

Gasification

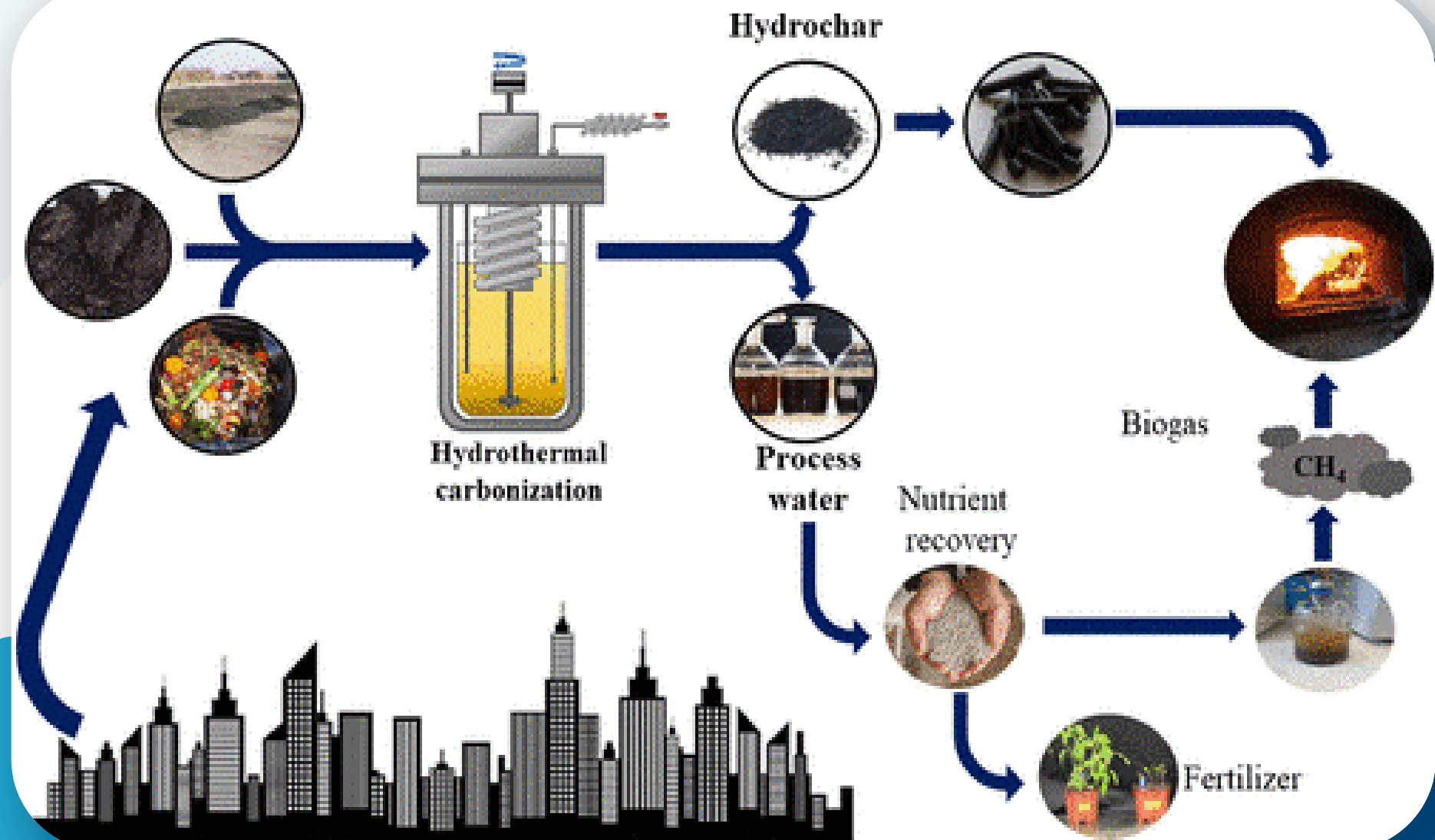
This is a high-temperature process that converts biomass into a gas mixture called syngas, which can be used to generate electricity, heat, or further converted into chemicals and fuels. The biochar is produced as a byproduct of the gasification process.



Techniques for Biochar production

Hydrothermal carbonization

This is a process that uses high pressure and temperature to convert biomass into a carbon-rich material. It is a relatively new technique and has been used to produce biochar on an industrial scale.



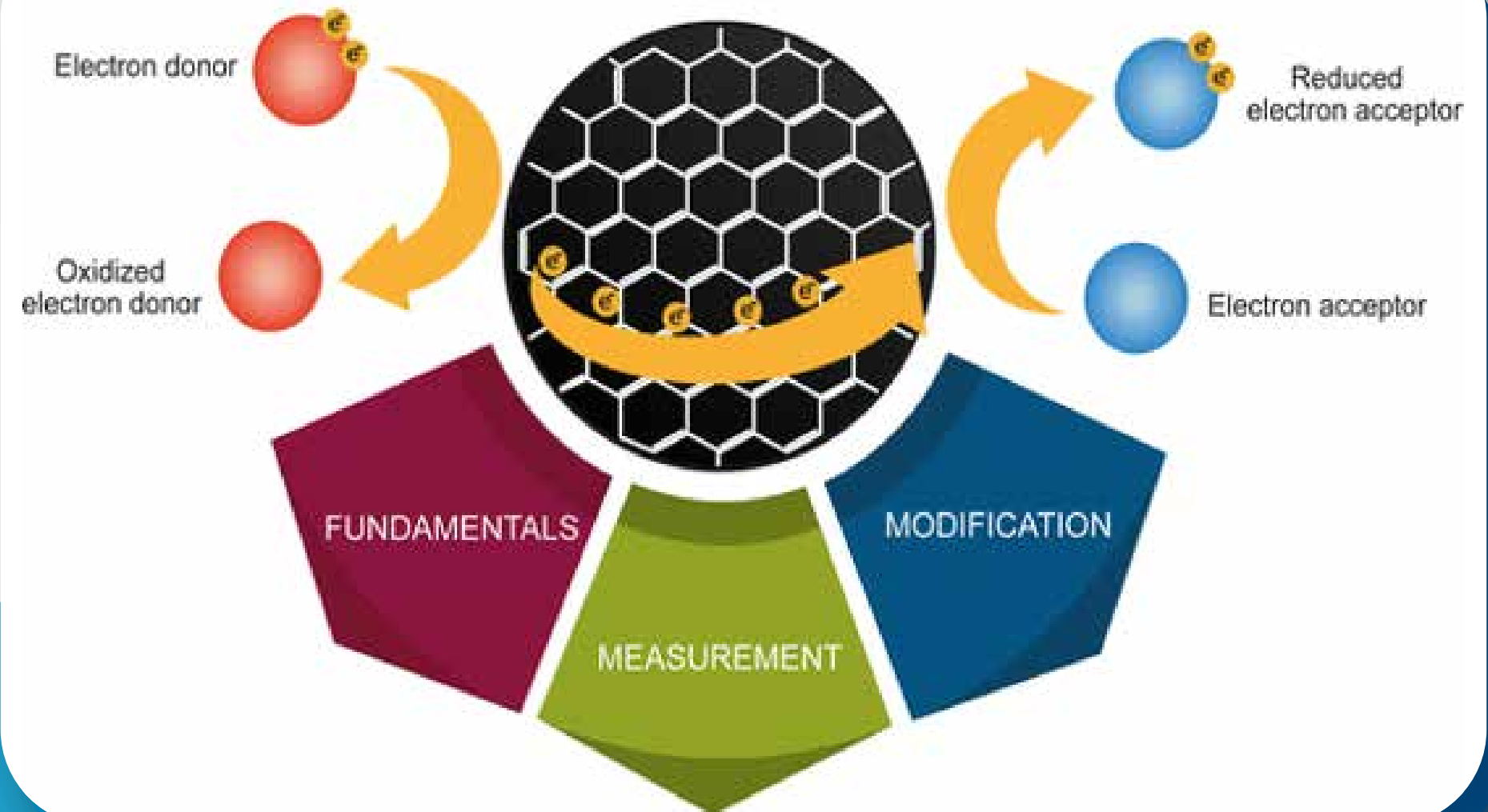
Properties

- High carbon content (60-95% C).
- Resistant to biodegradation.
- Significant adsorptive qualities (similar to activated carbon).
- Nutrients (& contaminants) essentially lock on to the structure.
- Increases moisture holding capacity. Enhances microbial biomass.

Enhanced biochar yields from

- Lower temperatures
- Higher pressures
- Longer vapour residence time
- Slower heating rate
- Larger particle size

ELECTROCHEMICAL PROPERTIES OF BIOCHAR

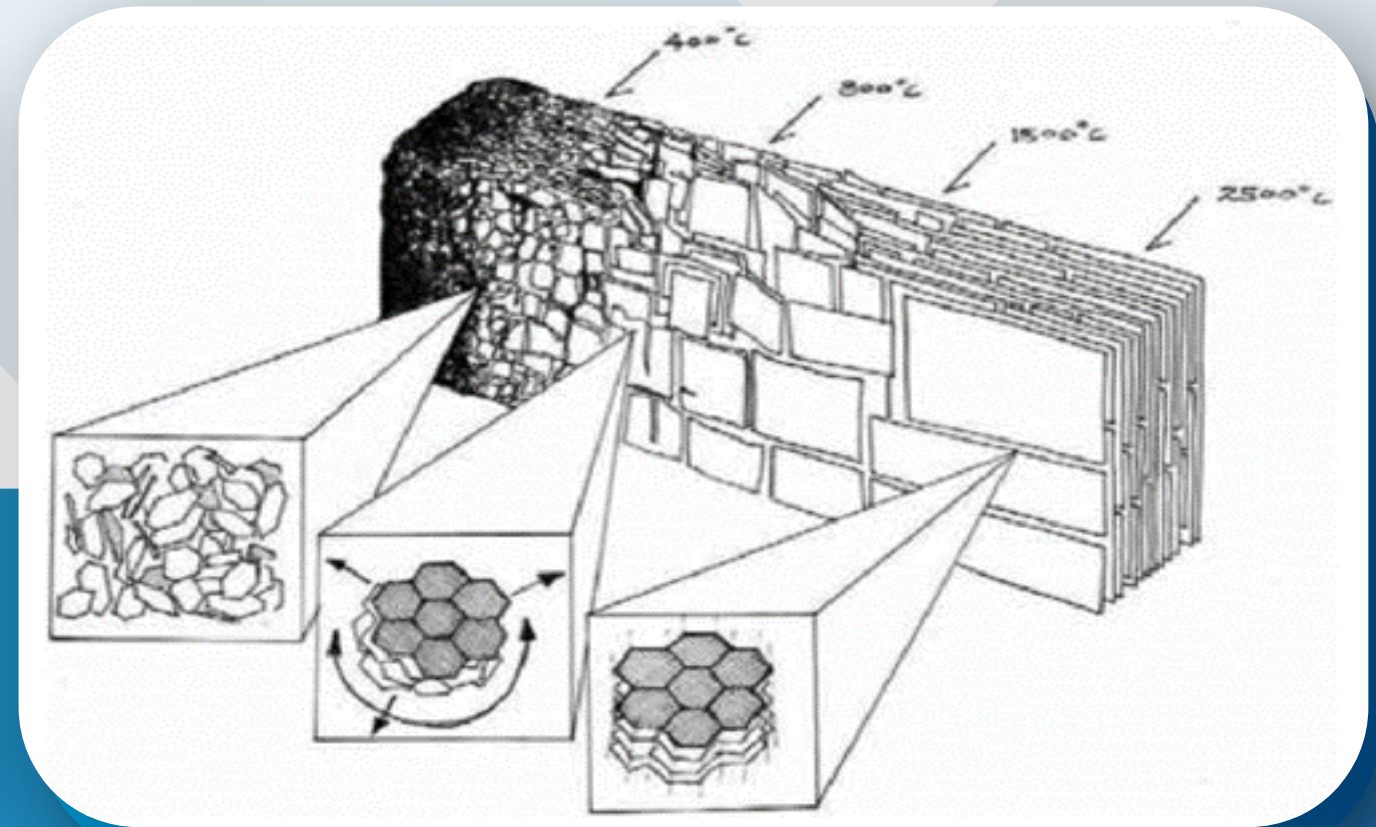


Feedstock Materials

- The variable nature of the chemical constituents in the feedstock biomass influence the structure, properties & yield of biochar.

Process Conditions

- Biochar yield decreases
- Fixed carbon increases
- Surface area increases
- Ash content increases



TRUSTED PARTNERS

AFCONS

Technip

TÜV

ISO 14001:2004

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TATA CONSULTING ENGINEERS LIMITED

SC Shroff Consultants

STERLING & WILSON

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