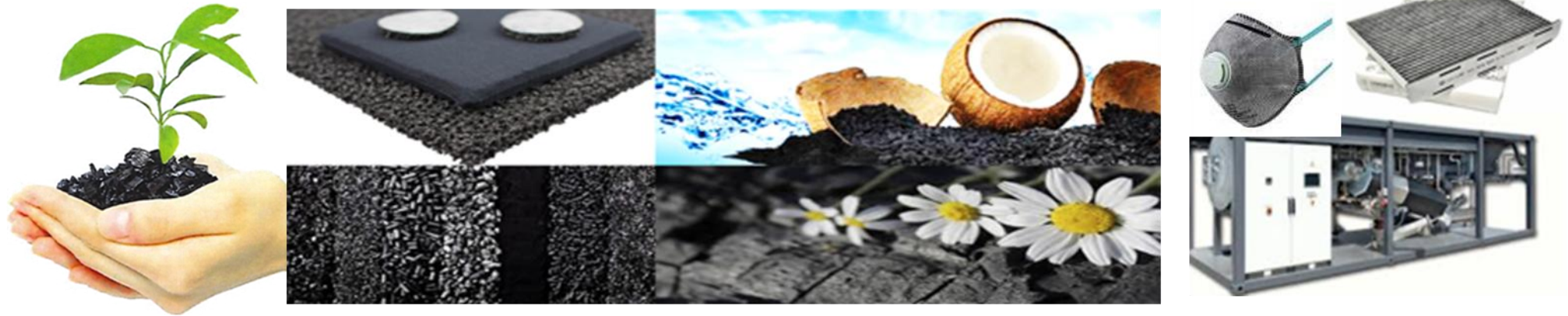




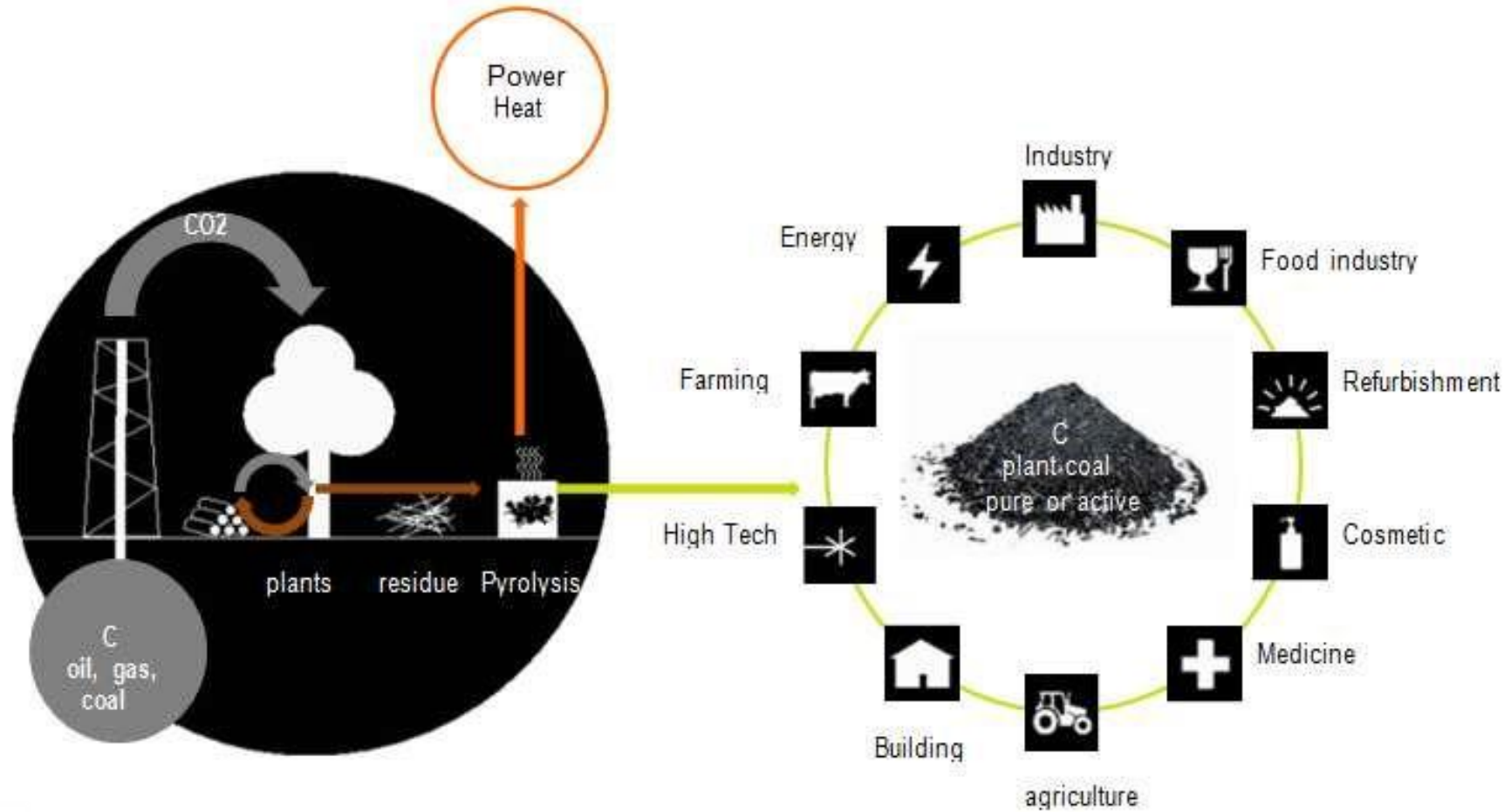
**Biotech Energy**



# High Quality Bio Plant Coal

## Bio-Plant Coal Cycle

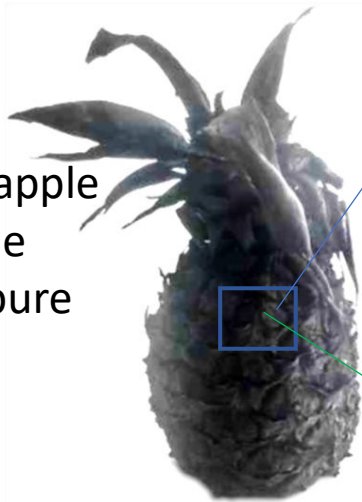
# Bio-Plant coal cycle



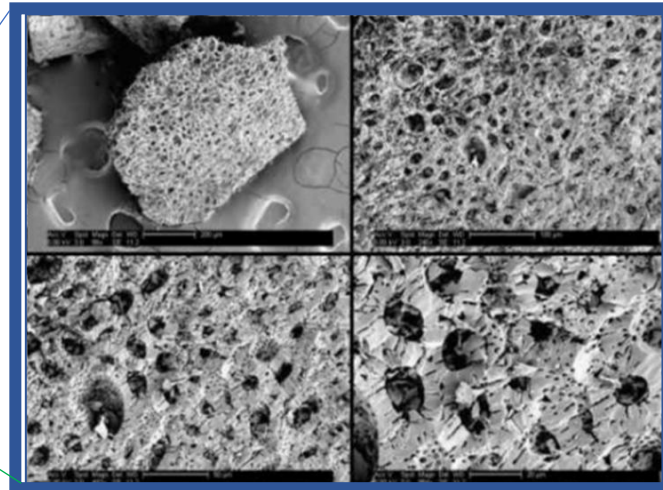
# Biotech-Plant Coal

Our novel innovative **high-tech pyrolytic carbonisation plant**, produces reproducible and certified coal from any organic and carbon-containing starting materials (pre and end products)

**Example:** A pineapple will have after the pyrolysis only a pure carbon skeleton.



The coal is **highly porous** and has depending on the starting material a surface of up to **1,700 qm/g** depending the raw material (about 4 g ~ Soccer field)



→ **highly effective storage**

- ▶ Minerals
- ▶ Water (50-fold volume)
- ▶ Microorganisms
- ▶ Pollutants (filters)
- ▶ CO<sup>2</sup> (several thousand years)

→ **Energy**

# Effects and benefits of Bio Plant Coal I



- ▶ **Farming:** Reduction of antibiotics, higher quality, less in climate gases, **Quick-use organic manure** (Feed coal)



- ▶ **Remediation of contaminated soils and water bodies**

- ▶ **Binding of pollutants**

(E.g. Nitrate, methane and nitrous oxide in the soil (Kammann et al., 2012))



- ▶ **Bio-fields / Renouncement of artificial fertilizer**

10 - 40% higher harvest yields, ([www. Terrapretawiki.org](http://www.Terrapretawiki.org))

- ▶ **Reduction of nitrate in groundwater**

(Ding et al, 2010; Sing et al, 2010; Steiner et al., 2010)

- ▶ **Recovery of quilted and devastated land**

Water and nutrient storage (drought, flooding, erosion) (Glaser et al., 2002)





# Effects and benefits of Bio Plant Coal II



- ▶ Stable and top-quality heat and sound insulation (Plaster as well as filling material for wall, floor, ceiling)



- ▶ Filter systems (active carbon and their regeneration)



- ▶ Carbon black for car tires, rubber and plastics
- ▶ Heating in aluminum recycling, enrichment of carbon in metallurgy



- ▶ High-quality barbecue charcoal from sustainable production
- ▶ Energy storage
- ▶ Pre-product for pure carbon
- ▶ Carbon fibers



Many innovative and environmentally friendly products for humans, animals and the environment

food packaging

air cleaning

adsorber in  
functional clothing

insulation in  
the building  
industry



as carbon electrodes in super-capacitors for  
energy storage

Organic managed  
agriculture



soil remediation

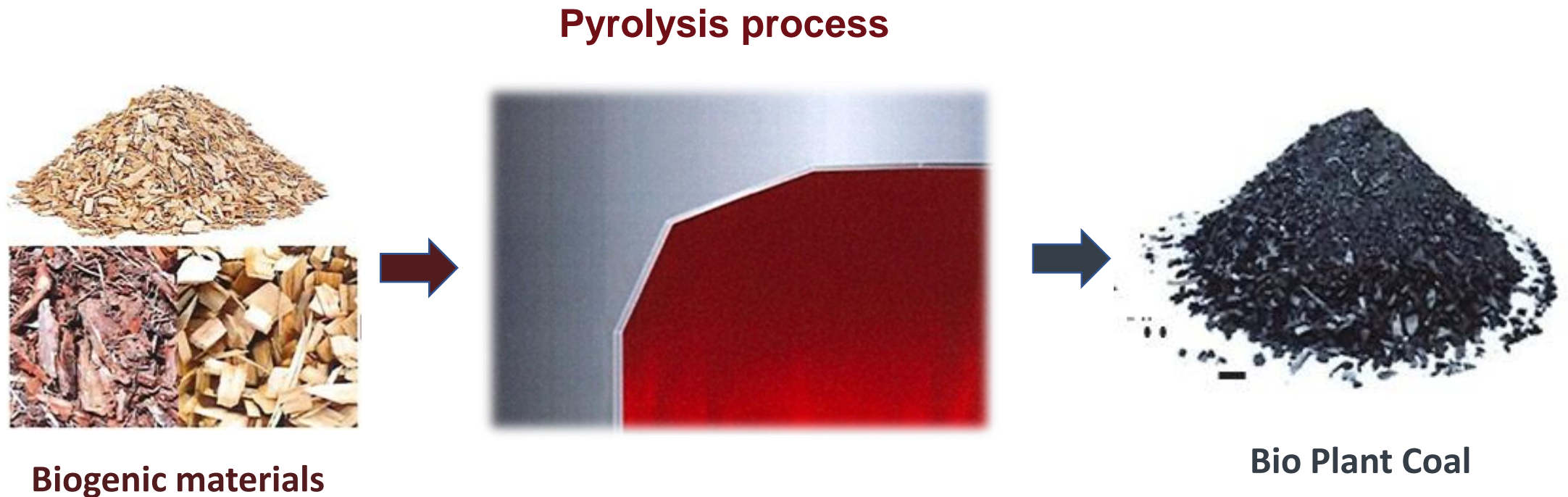


silage agent

feed supplement.

waste water  
treatment

# How Bio Plant Coal is produced



# High Tech Pyrolysis System I

This is an unique technology that consists of organic waste

**Clean and effective coal production with up to 98% carbon content**

- ▶ High availability (350 days / year)
- ▶ By using self-produced, excess energy, generates 41 MW/h of electricity and heat annually
- ▶ Modular system concept
- ▶ **Amortization ~ 5 years (depending on market mix)**
- ▶ Environmentally friendly approx. 11,000 t CO<sub>2</sub> from the atmosphere
- ▶ Many innovative and environmentally friendly products for humans, animals and the environment

A benefit for humans, fauna and environment





# High Tech-Pyrolysis system II

## Individual characteristics, special features and differentiation

- ▶ The world's **first fully automated**, process-controlled and **continuously producing system**
- ▶ Worldwide reproducible as soon as input material: waste/ residues are present.
- ▶ Suppliers are easy to find.
- ▶ The markets exist and can be delivered immediately.
- ▶ The use of the products is so diverse that fluctuations in individual markets can be offset.



- ▶ New products with maximum value added are under development
- ▶ Parts of the technology, processes and products are protected
- ▶ Prototype plant has been producing for 10 years
- ▶ The pilot plant has been producing since 2016.
- ▶ Expert team for operations, R & D, marketing, development and multiplication available.

# Innovative Technology

- ▶ The world's **first fully automated**, process-controlled and **continuously producing system**
- ▶ Applicable with the **entire spectrum of biomass, any biogenic source or carbonic material** = Unlimited application possibilities for the combustion of biomass
- ▶ **Energy supply input** – Power and district heating (Produces simultaneously both electricity and useful heat) Co-generation/Tri-generation (also Combined Heat and Power, CHP)
- ▶ Degree of **purity of bio coal** up to 98 % C-content
- ▶ Ecological and carbon neutral/Technology that achieves **emission levels far below the thresholds permitted by law** (Low emission, low energy demand, carbon negative (European patent, highest quality standard, 10 years of R&D)



Turnkey solutions: Plant design for scalable output (3000, 4500, 6000, 9000, 12000 t/year)



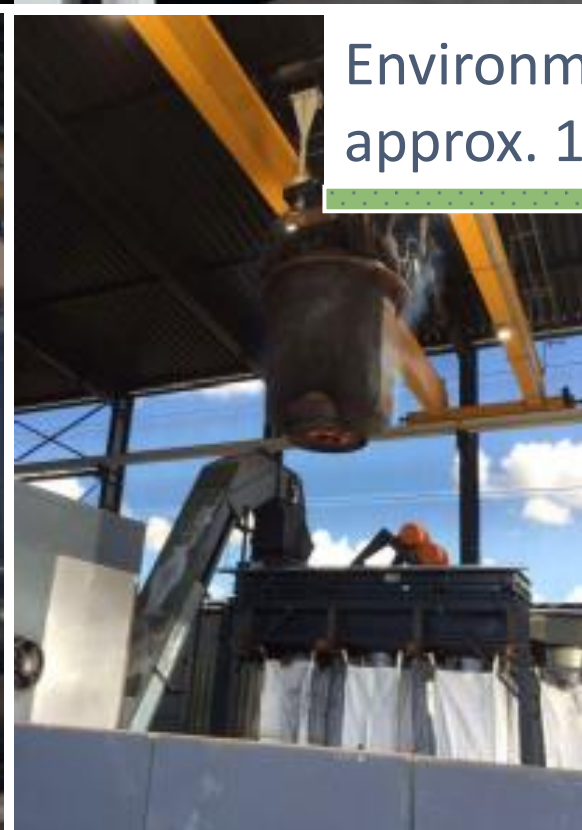
Significantly increase of efficiency and operational security





**The world's first fully  
automated, process-  
controlled and continuously  
producing system**





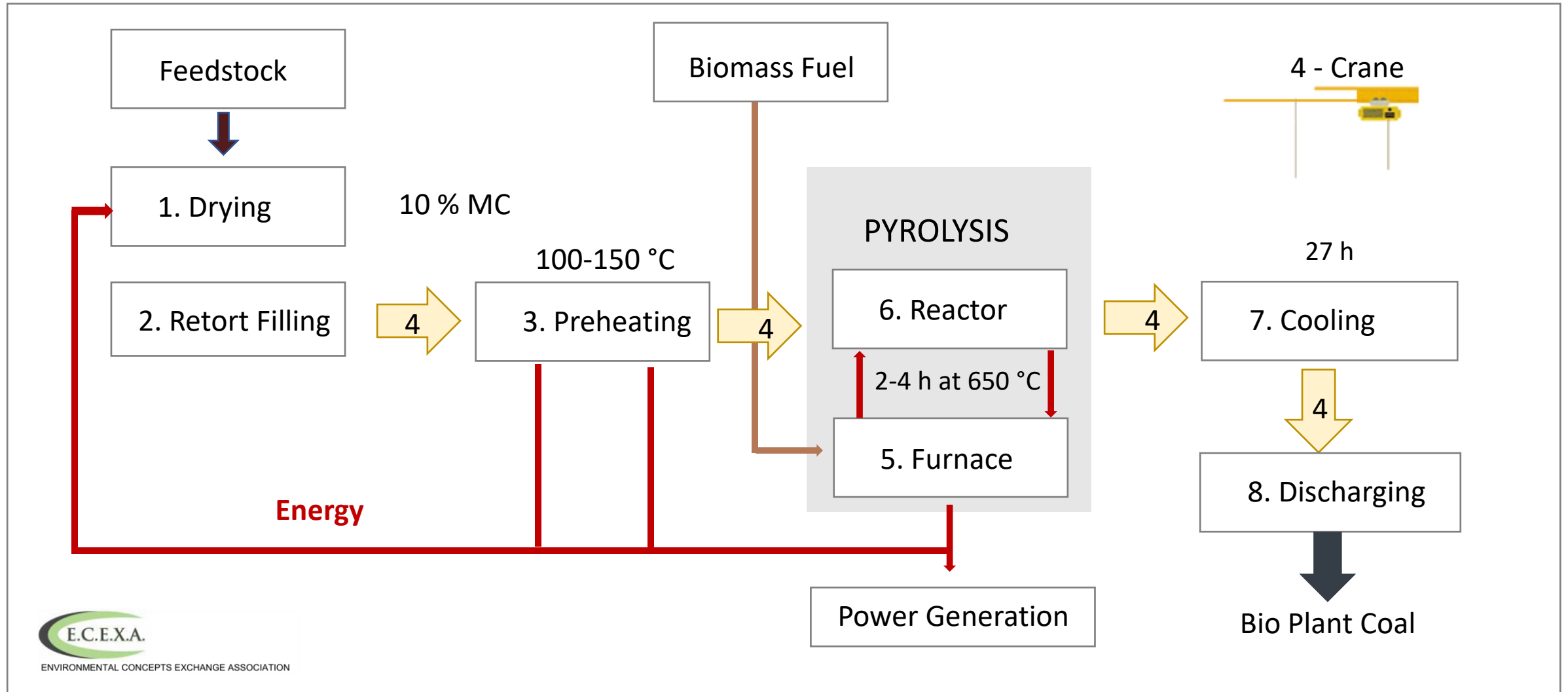
Environmentally friendly  
approx. 11,000 t CO<sub>2</sub> from the atmosphere





# Pyrolysis-Process

→ Material flow  
→ Energy flow



# High Tech-Pyrolysis System

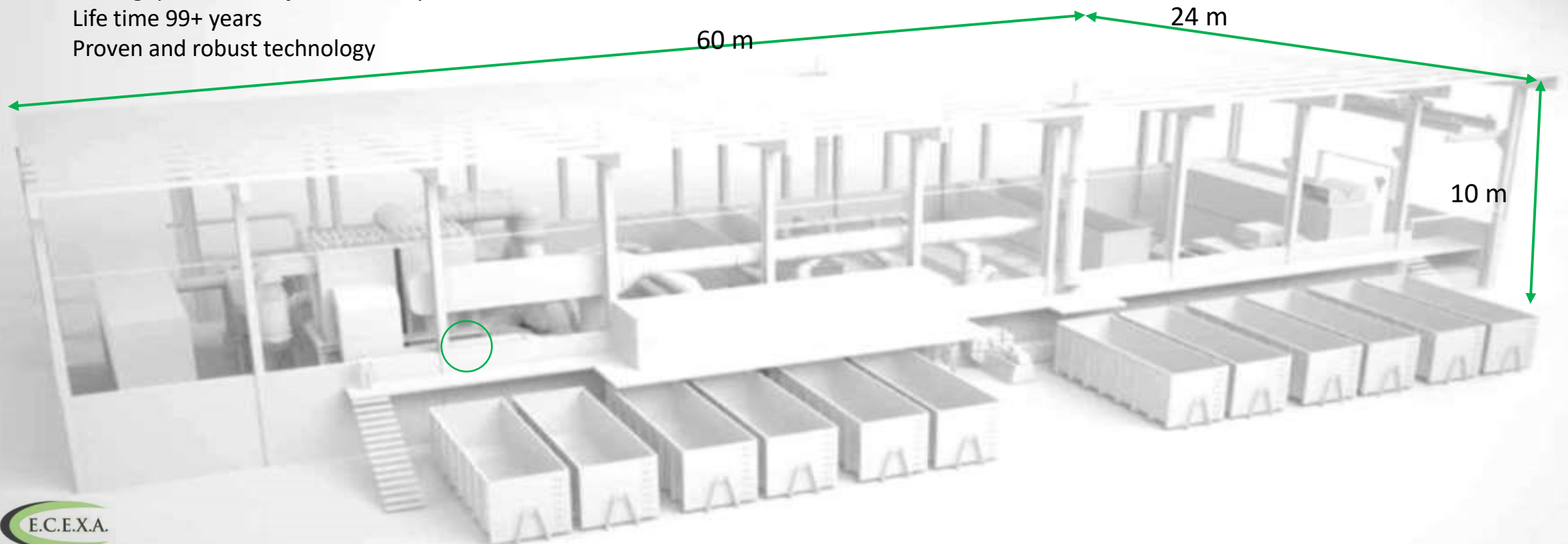
Production tool of energy and bio tech plant coal

Plant coal **3,000 t/year**

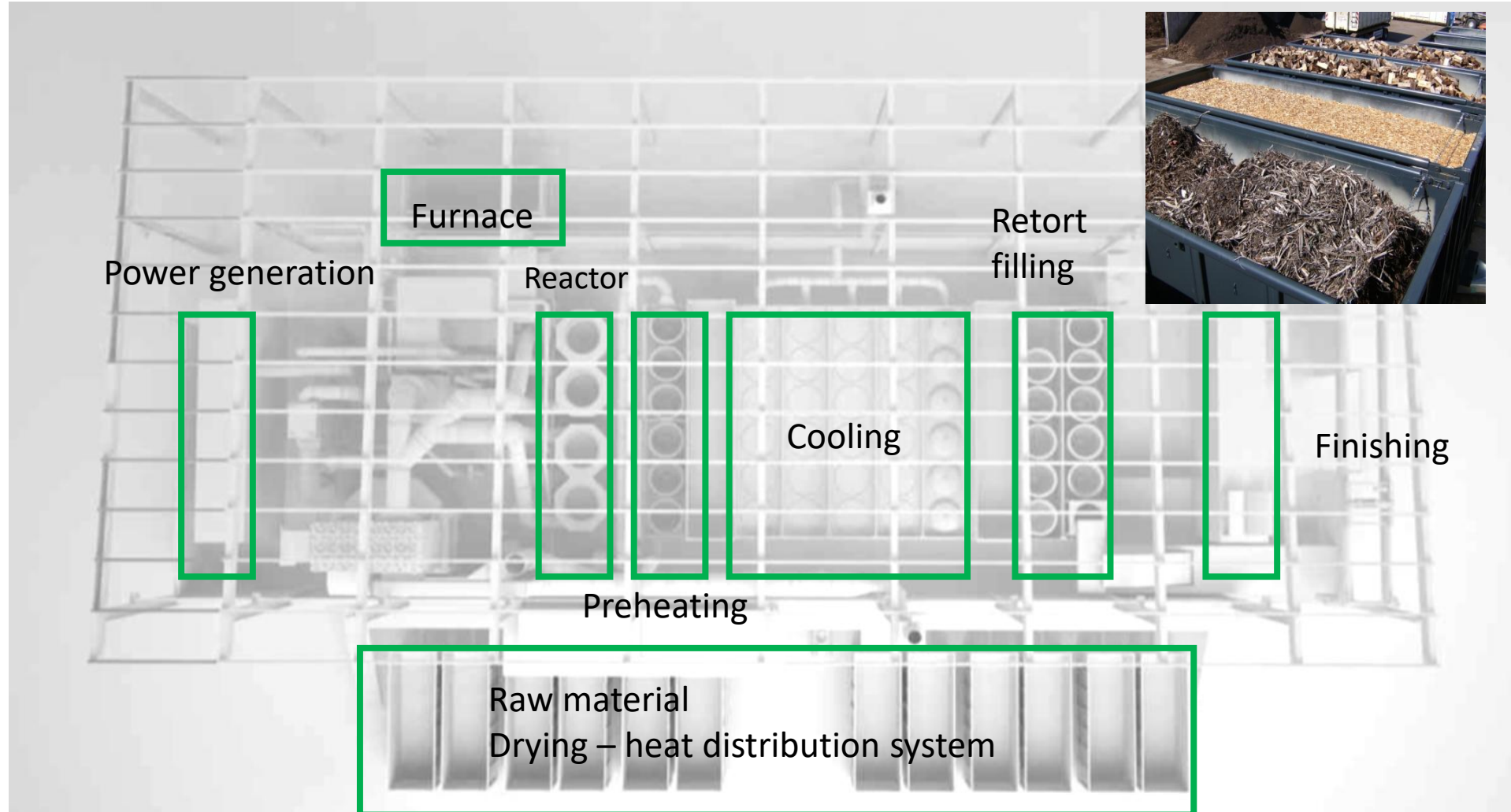
Throughput **8,400 h/year** - 350 days

Life time 99+ years

Proven and robust technology



# System and Process





## Biotech Energy

# High Quality Plant Coal Bioplant Coal Cycle

ECEXA Bio-Plant Coal - A benefit for human, fauna and environment

- ▶ Produces high quality Bio-Plant Coal
- ▶ For the entire spectrum of biomass
- ▶ Co-Generates electricity and heat

---

E.C.E.X.A. Environmental Concepts Exchange Association e.V., ZVR 810905603

A-2500 Baden, Erzherzogin Isabellestraße 112 – Austria

[office@ecexa.at](mailto:office@ecexa.at)

[www.ecexa.at](http://www.ecexa.at)

Tel. ++43(0)664 1420306