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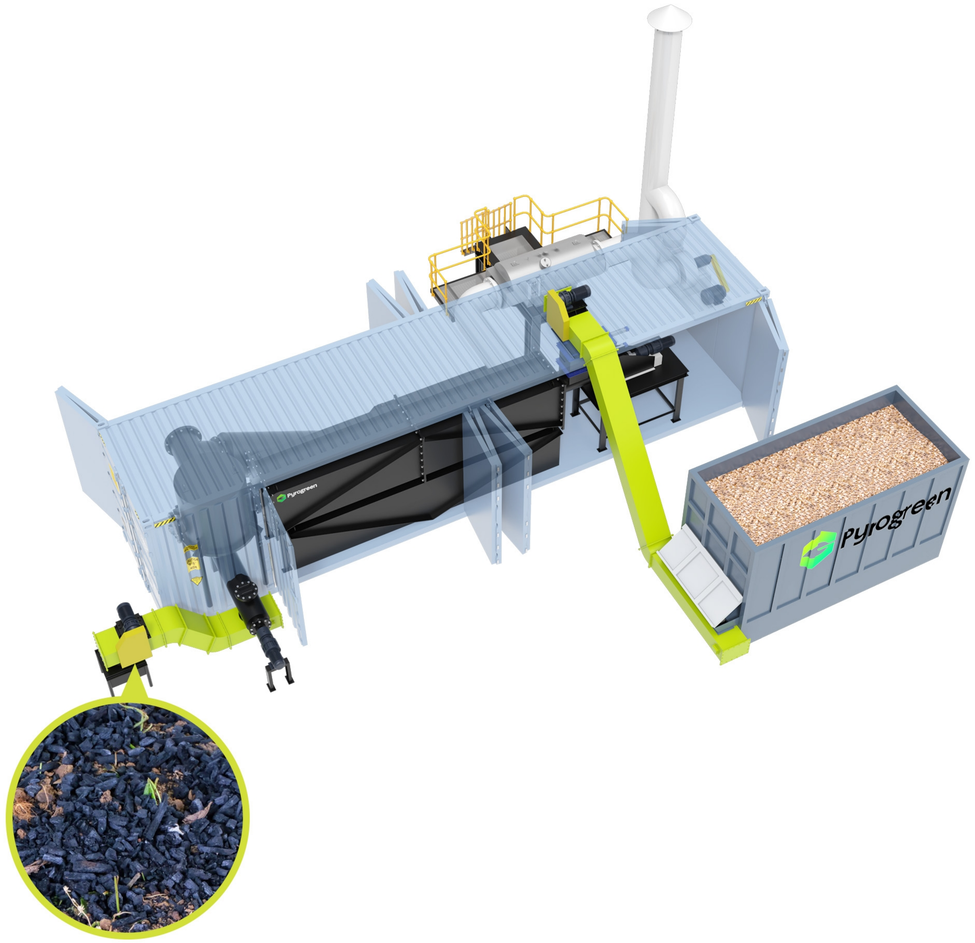

NET ZERO TECHNOLOGY

BREATHING FOR THE PLANET

Pyrogreen Energy

Wuxi Powermax Renewable Energy Technology Co.,Ltd.
Wuxi Teneng Power Machinery Co., Ltd.

www.powermaxgasifiers.com

www.pyrogreen-energy.com

Company Address: 6th floor, Chuangrong Building Block C, Danshan Road, Anzhen Street, Xishan District, Wuxi, Jiangsu, China.
Factory Address: No.26 Jingrui Rd, Xibei Town, Xishan District, Wuxi, Jiangsu, China.

Pyrogreen - Biomass Carbonization/Torrefaction Solution

“Biochar, Green Energy, a Carbon-reduced Future.”

SOIL
ADDITIVE

As a soil additive, biochar can improve soil structure, increase soil fertility, improve soil water and fertilizer retention capacity, and promote plant growth.

FEED
ADDITIVE

As a feed additive, biochar can improve the digestion and absorption capacity of animals, improve intestinal health, reduce ammonia emissions, and promote animal growth.

FILLING MATERIAL
IN PRODUCTION

In the field of metallurgy and casting, the biochar can be used to cover on the surface of the liquid steel and iron to reduce the radiation, convection and thermal loss.

BUILDING MATERIAL
ADDITIVE

As a building material additive, biochar can be used to prepare environmentally friendly concrete, bricks and other building materials.

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"Innovating Net-zero Technologies to Build a Carbon-neutral World"

Excessive accumulation of carbon dioxide (CO2) in the atmosphere is a major cause of global warming and climate change. The burning of fossil fuels, deforestation and industrial production have led to significant increases in carbon dioxide levels, causing a range of adverse effects such as rising temperatures, extreme weather events and ecosystem damage.

Global carbon dioxide (CO2) emissions from energy combustion and industrial processes1 grew 0.9% or 321 Mt in 2022 to a new all-time high of 36.8 Gt. This estimate is based on the IEA' s detailed region-by-region and fuel-by-fuel analysis, incorporating the latest official national statistics and publicly available data on energy use, economic indicators, and weather.

Last year' s increase follows two years of exceptional oscillations in energy-related emissions. Emissions shrank by more than 5% in 2020, as the Covid-19 pandemic cut energy demand. In 2021, emissions rebounded past pre-pandemic levels, growing more than 6% in tandem with economic stimulus and the roll-out of vaccines.

To combat these effects, carbon from the atmosphere must be actively removed.

Pyrogreen's biomass energy conversion technology can serve as a solution to the current problem.

"Our equipment can not only convert biomass into energy, but also produce biomass charcoal. This comprehensive utilization of biomass provides you with an efficient and environmentally friendly solution. Through our technology, you can not only achieve With the goal of converting waste into clean energy, you can also obtain high value-added biomass carbon products.

This recycling method is not only beneficial to environmental protection, but also creates more business opportunities for your company and helps you achieve sustainable development target."

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Pyrogreen

— A POWERMAX RENEWABLES COMPANY

ISO SGS CE

10000m²
Production Center

1000m²
Company Area

50+
Core Technical Members

RESEARCH CENTER

The company has a professional production technology team

20+
With 20+ R&D and production staff, we are constantly developing new green energy systems independently

200+
More than 200 patents and high-quality academic articles related to biomass gasification technology

CREEN TECH.
MANUFACTURING
SOLUTIONS

RESEARCH
& DEVELOPMENT
FOR COMPANIES

LARGE SCALE
BIOCHAR
PRODUCTION

CARBON DIOXIDE
REMOVAL
MARKET

Wuxi Powermax Renewable Energy Technology Co., Ltd. is a science and technology enterprise with the main business of green renewable energy, green chemical industry and energy saving and environmental protection. Our core technologies are biomass pyrolysis and gasification technology, low speed gas power generation technology, syngas to green hydrogen, green ammonia and green methanol technology.

The main application of the products is to utilize waste biomass to produce biochar through biomass pyrolysis and gasification technology, and produce combustible gas for power and heat generation or green hydrogen, green ammonia, green methanol and other bio-energy products, It enables organic waste from agriculture, forestry, animal husbandry and so on to be returned to the benign recycling system of material and energy, and to help the development of the global bio-economy and realize the goal of carbon reduction and carbon negativity. Contribute to the development of the global bioeconomy and the realization of carbon-reducing and carbon-negative goals.

The company has a professional production and processing factory and experimental base with a building area of 10,000 square meters in Xishan District, Wuxi City. The company has a professional production and technical team, which effectively guarantees the quality of the equipment in the projects undertaken by POWERMAX. In addition, POWERMAX also assumes the production and R&D base for the structural innovations in it’ s core business of biomass gasifier (updraft fixed bed, downdraft fixed-bed, fluidized bed gasifier), biomass oxygen-enriched gasifier (updraft fixed bed gasifier), biomass pyrolysis and carbonization furnace (externally heated rotary kiln-type continuous charcoal furnace and baking furnace, spiral externally heated continuous charcoal furnace, pyrolysis external electrically heated continuous carbonization furnace and large and small-scale biomass gasification and power generation system).

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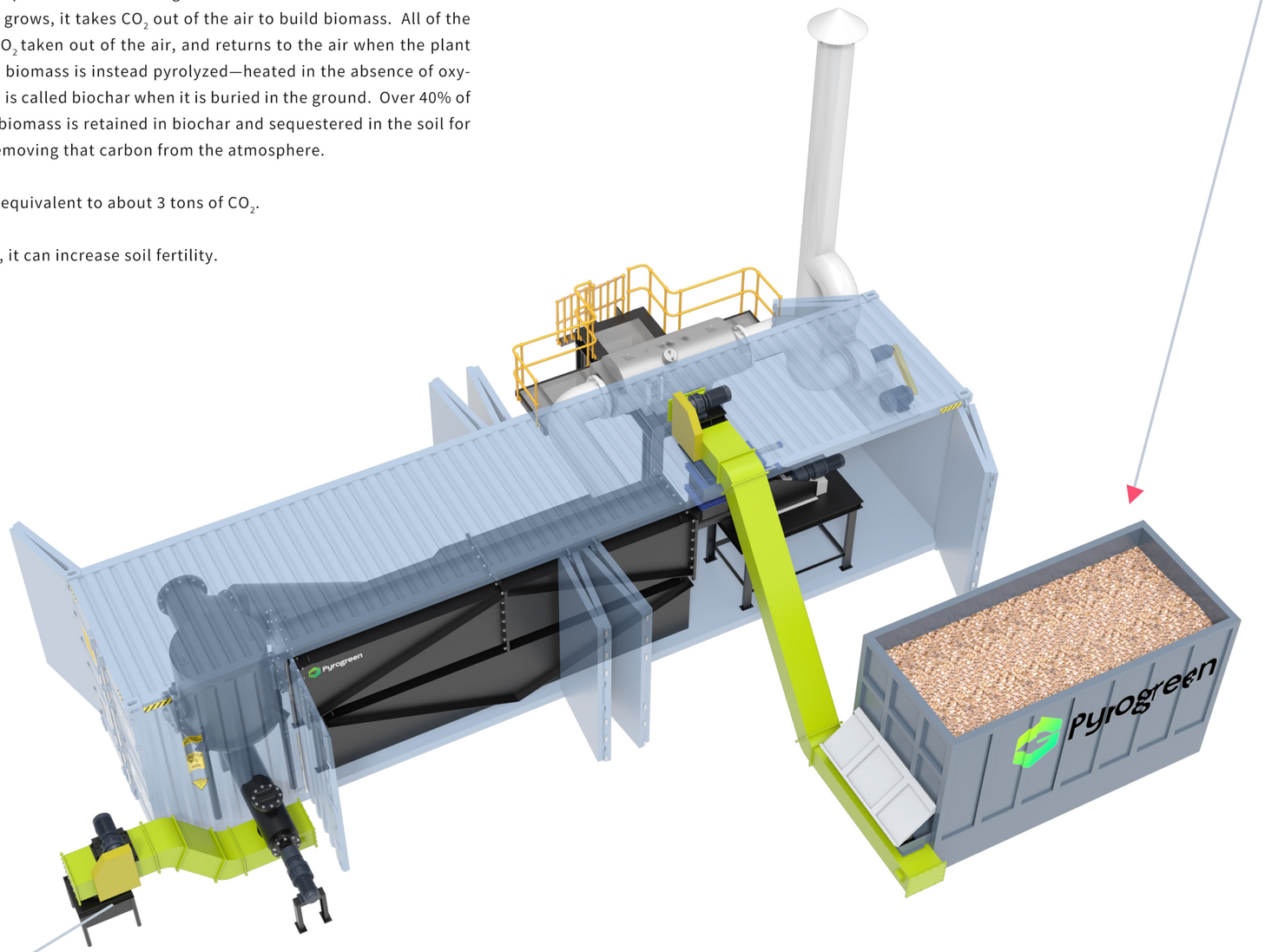
Different Raw Materials Can Get Different Biochar

Biochar is a carbon negative, charcoal based, soil amendment that can be designed to help reclaim and improve marginal soils by increasing soil water holding capacity and enhancing fertility, while also generating high-value renewable energy co-products during its production.

If deployed correctly, the biochar process is carbon negative: it removes net carbon from the atmosphere. When a green plant grows, it takes CO_2 out of the air to build biomass. All of the carbon in the plant came from CO_2 taken out of the air, and returns to the air when the plant dies and decomposes. When the biomass is instead pyrolyzed—heated in the absence of oxygen—it produces charcoal, which is called biochar when it is buried in the ground. Over 40% of the total carbon from the waste biomass is retained in biochar and sequestered in the soil for thousands of years, effectively removing that carbon from the atmosphere.

The carbon in 1 ton of biochar is equivalent to about 3 tons of CO_2.

Biochar is not only a carbon sink, it can increase soil fertility.



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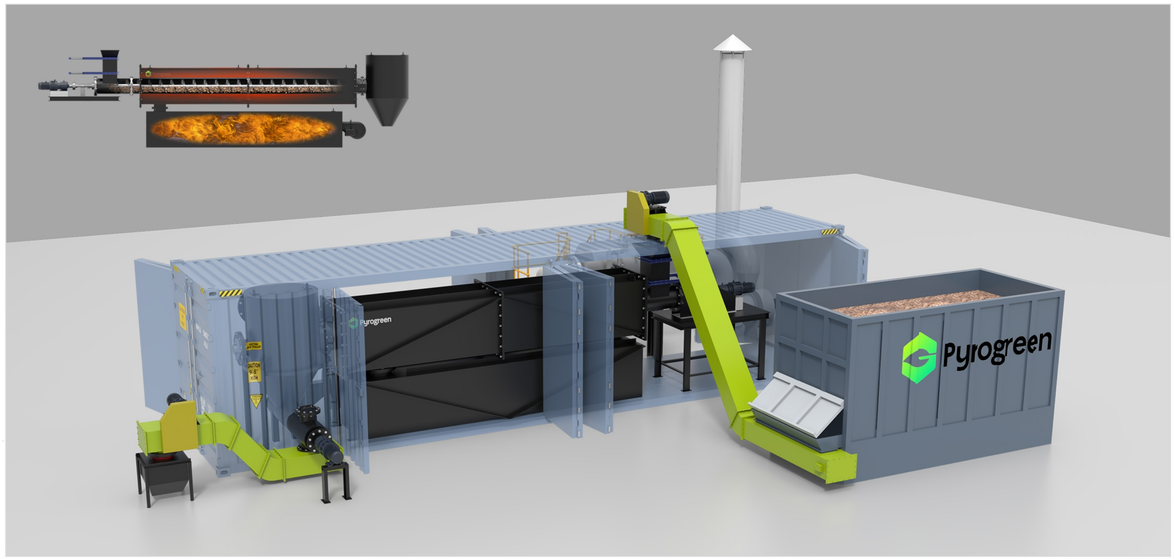


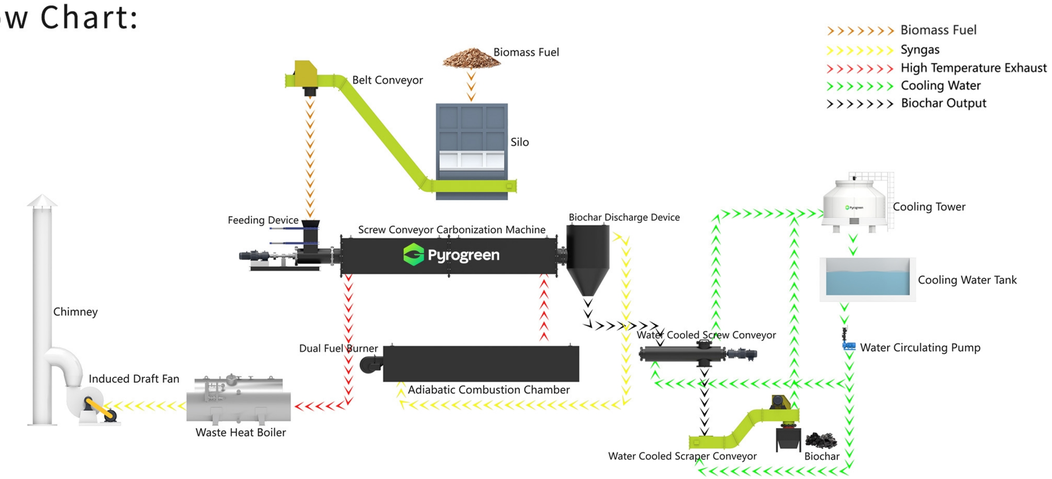
Screw Conveyor Carbonization/Torrefaction System

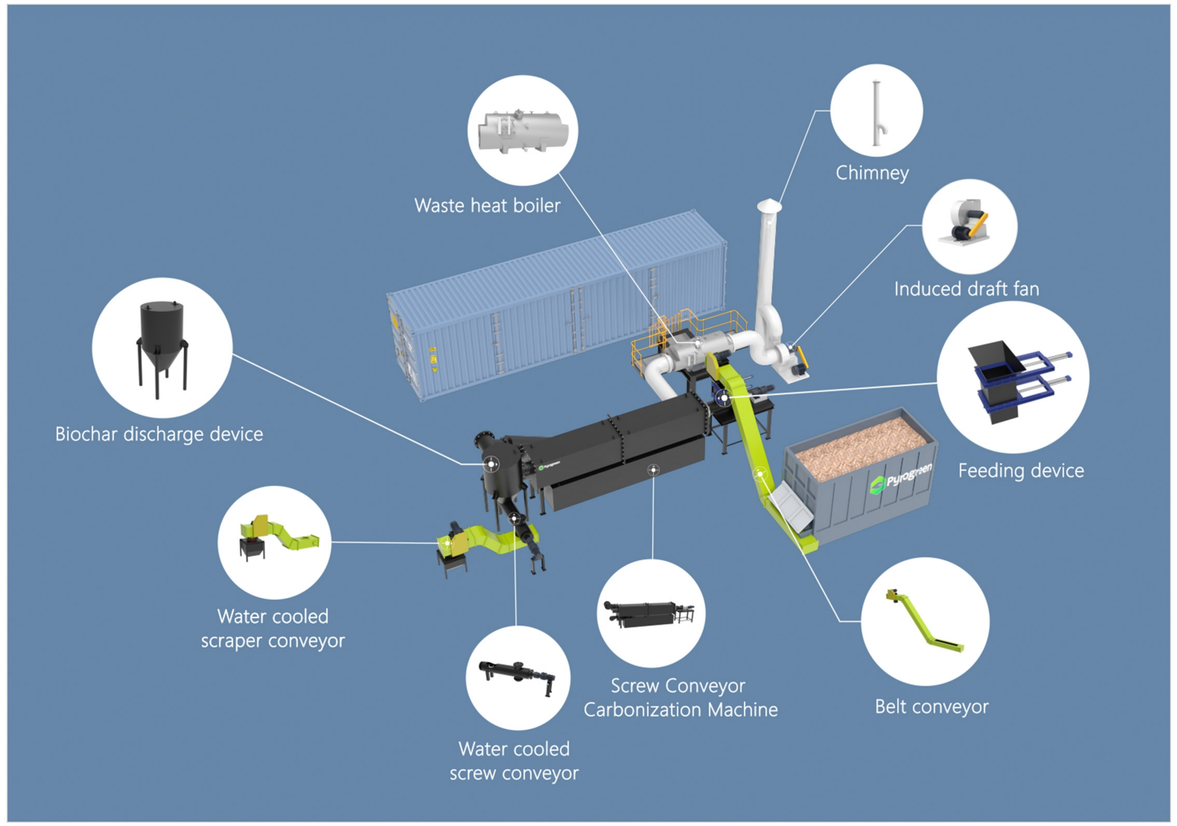
As a leader in advanced thermal processing systems, Pyrogreen provides custom screw conveyor carbonization system for the production of biochar from a variety of sources. Sometimes referred to as torrefaction, the pyrolysis of biomass into a high quality biochar product is a technical endeavor, requiring advanced knowledge of thermal processing principles.Pyrogreen process experts can work with you to design this system around your unique source of material.

Advantage:

- Modular Concept, easy transportation and installing.
- No tar and liquid waste production.
- Fully Automation.
- Extremly Low NOx, CO, Particle Emission.
- High thermal efficiency and high biochar quality and quantity production.

Flow Chart:





Parameters:

Biomass Screw Conveyor Carbonizer		
Model	BSCC 1000	BSCC5000
Feed Rate	1m³/h(300kg)	5m³/h(1500kg)
Footprint(L*H)	15m*10.5m	18m*12.5m
Working Mode	Continuous	
Feed Requirements	Size≤20mm(5-8mm is optimal)，MC≤15%	
Construction	Indirect Heating Screw Conveyor Type	
Control Mode	PLC Control System	
Material	SS310S+SS304	
Pressure	Micro Negative Pressure	
Heating fuel	Diesel, natural gas, heavy oil,etc	
Heating Mode	Indirect Heating	
Noise(dB)	≤80	
Cooling Mode	Circulating Water Cooling	

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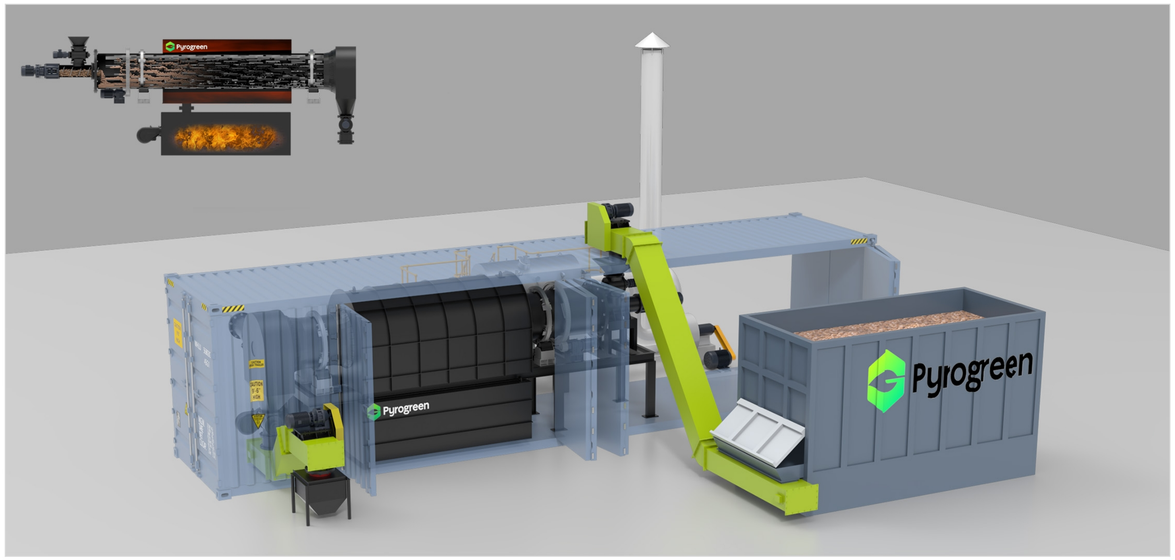


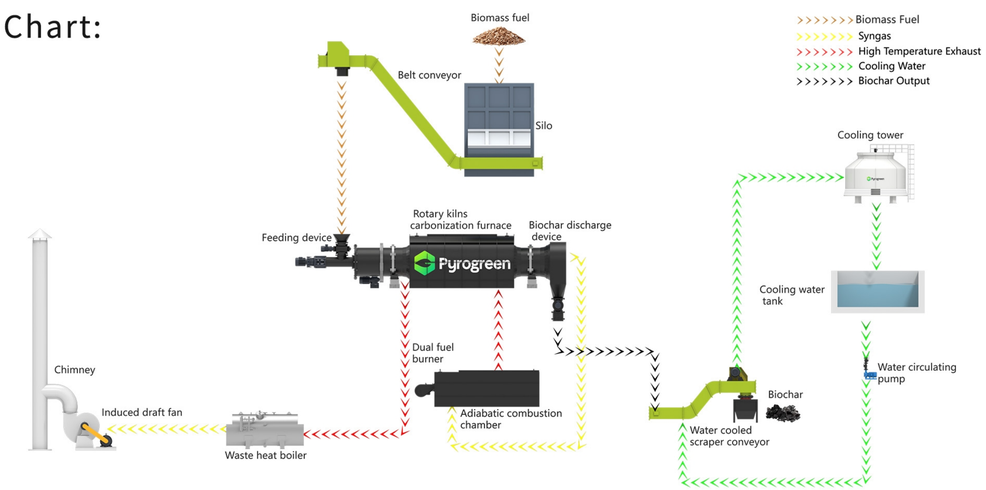
Rotary Kilns Carbonization/Torrefaction System

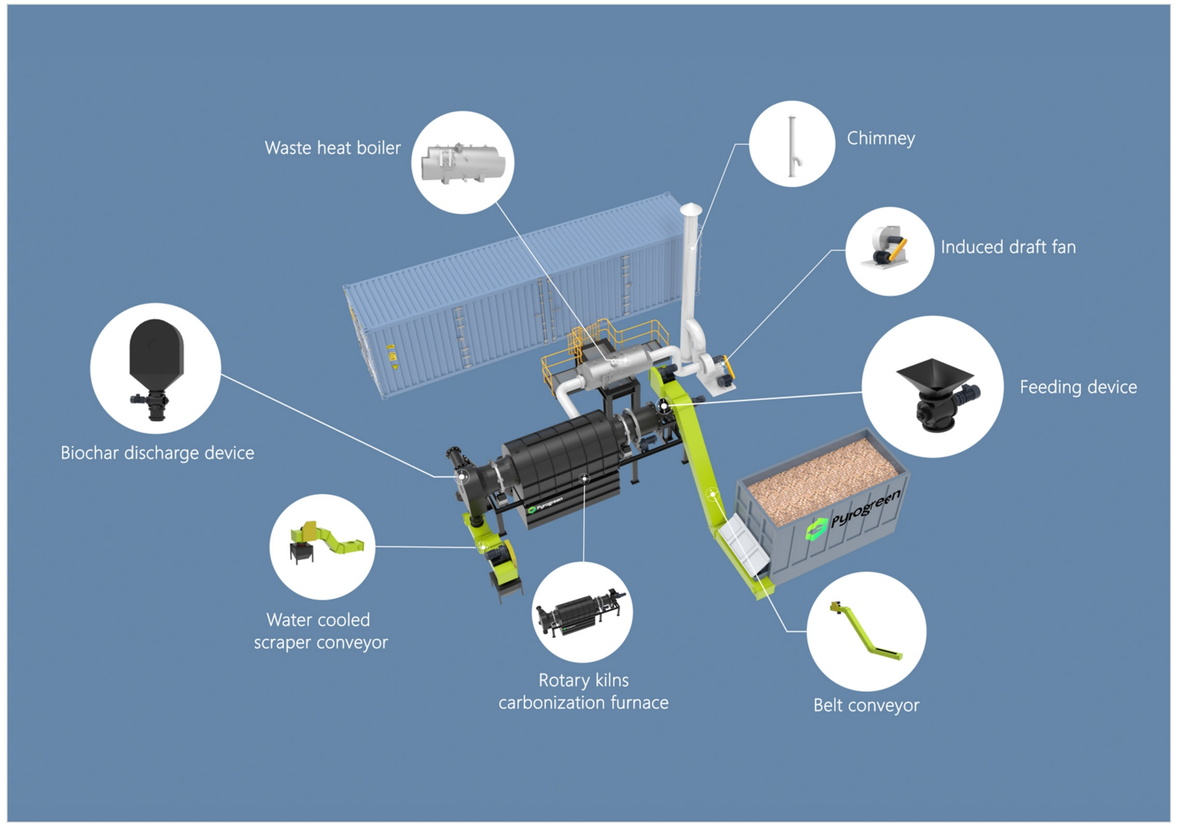
As a leader in advanced thermal processing systems, Pyrogreen provides custom rotary kilns carbonization system for the production of biochar from a variety of sources. Sometimes referred to as torrefaction, the pyrolysis of biomass into a high quality biochar product is a technical endeavor, requiring advanced knowledge of thermal processing principles.Pyrogreen process experts can work with you to design this system around your unique source of material.

Advantage:

- Modular Concept, easy transportation and installing.
- No Tar and liquid waste production.
- Fully Automation.
- Extremly Low NOx, CO, Particle Emission.
- High thermal efficiency and high biochar quality and quantity production.

Flow Chart:





Parameters:

Biomass Rotary Kilns Carbonizer					
Model	BRKC600	BRKC1000	BRKC1500	BRKC3000	BRKC5000
Feed Rate	0.6m³/h(200kg)	1m³/h(300kg)	1.5m³/h(500kg)	3m³/h(1000kg)	5m³/h(1500kg)
Footprint(L*H)	12m*10.5m	15m*10.5m	16m*11m	17m*12m	18m*12.5m
Working Mode	Continuous				
Feed Requirements	Size≤50mm，MC≤15%				
Construction	Indirect Heating Rotary Kilns Type				
Control Mode	PLC Control System				
Material	SS310S+Carbon Steel				
Pressure	Micro Negative Pressure				
Heating fuel	Diesel, natural gas, heavy oil,etc				
Heating Mode	Indirect Heating				
Noise(dB)	≤80				
Cooling Mode	Circulating Water Cooling				
Rotation Mode	External Gear Rotation				

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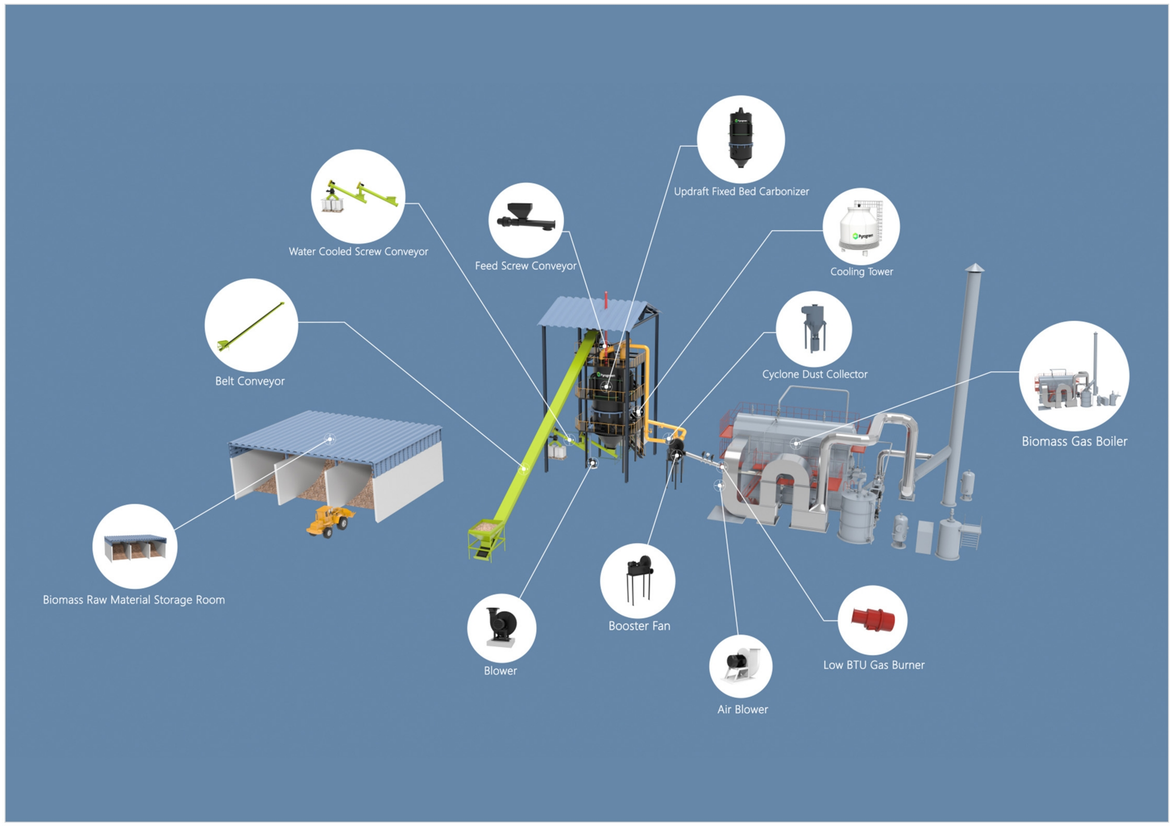
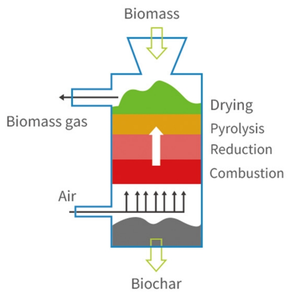


The process:

Biomass updraft fixed bed carbonizer is a machine that converts biomass such as wood chips, bamboo chips,coconut shell, fruit shells, under a lean oxygen atmosphere into biochar and combustible gas which could be piped to heat supply system as gas fuel.

The syngas generated from biomass carbonizer has a wide application and is often used for power generation (gas engines), residents used gas and thermal energy equipment (such as steam boilers, hot water boilers, industrial furnaces and kilns, incinerators, melting furnaces, industrial annealing furnaces, drying equipment, food drying equipment, baking varnish equipment, ironing equipment, asphalt heating equipment, die-casting machines, etc.). Charcoal/Biochar is used in our daily life and in industrial production and agriculture.



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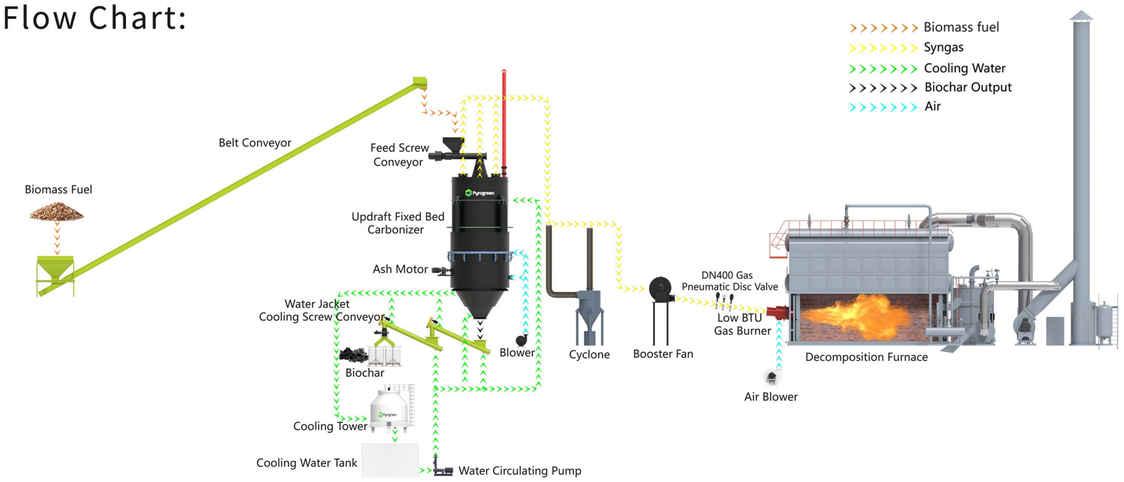

Parameters:

Biomass Updraft Fixed Bed Carbonizer							
Model		UFBC1000	UFBC1500	UFBC2000	UFBC2500	UFBC3000	UFBC4000	UFB5000
Carbonizer Type		Updraft Fixed Bed Carbonizer						
Range of Biomass Input		Wood chips, bamboo chips, Coconut Shell and etc.						
Size Requirement		20-100 mm						
Moisture Requirement		⩽ 30%						
Biomass Consumption(Kg/H)		1000	1500	2000	2500	3000	4000	5000
Heat Value of Gas		⩾ 1200 Kcal/Nm³						
Biochar output (Kg/H)		⩽ 150	⩽ 225	⩽ 300	⩽ 375	⩽ 450	⩽ 600	⩽ 750
Heat Ouput	Kcal/H	⩽ 1, 764,706	⩽ 2,647,059	⩽ 3,529,412	⩽ 4,411,765	⩽ 5,294,118	⩽ 7,058,824	⩽ 8,823,529
	KW/H	⩽ 2,052	⩽ 3,078	⩽ 4,104	⩽ 5,130	⩽ 6,156	⩽ 8,208	⩽ 10,260

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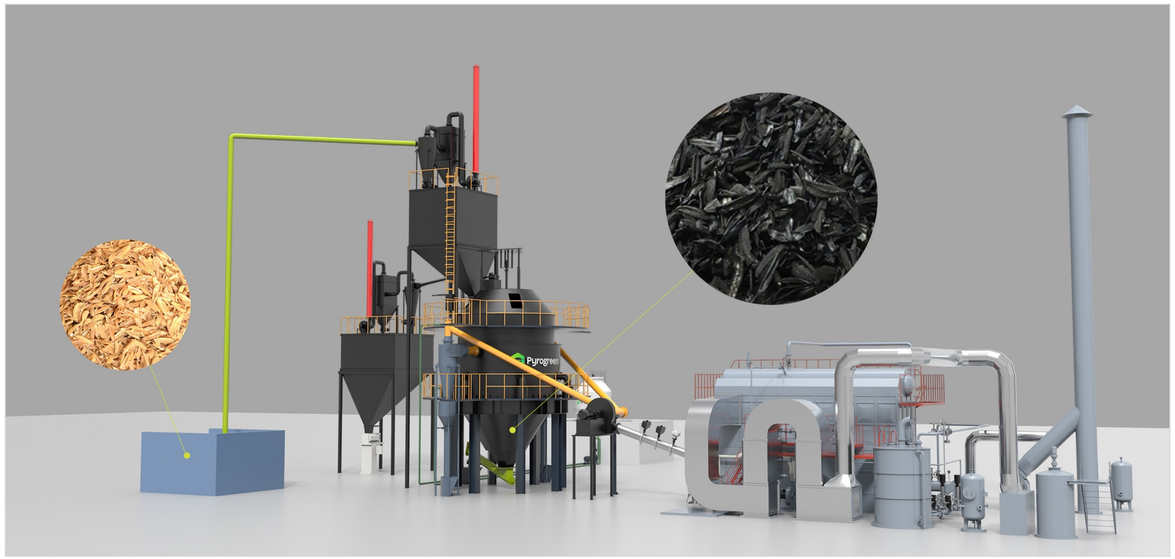
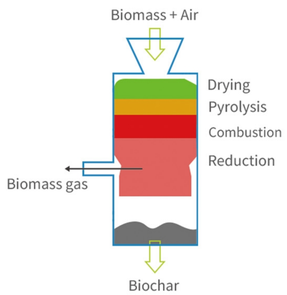


The process:

Pyrogreen Biomass (Rice Husk) Gasifier Heating And Co Production Of Rice Husk Charcoal System includes: material feeding system, carbonization system(fine material), burner , waste heat boiler system, flue gas treatment system, etc. The working principle is that the biomass(such as rice husk, straws, bagasse, peanut shells and sunflower seed shells etc) have pyrolysis and gasification reactions with limited oxygen in the gasifier and generate combustible gas. The gas goes into the thermal-insulated furnace directly and then produce hot flue gas Which turns into steam or hot water after the waste heat boiler for civil and industrial use. Biochar/charcoal is used in our daily life and in industrial production and agriculture.



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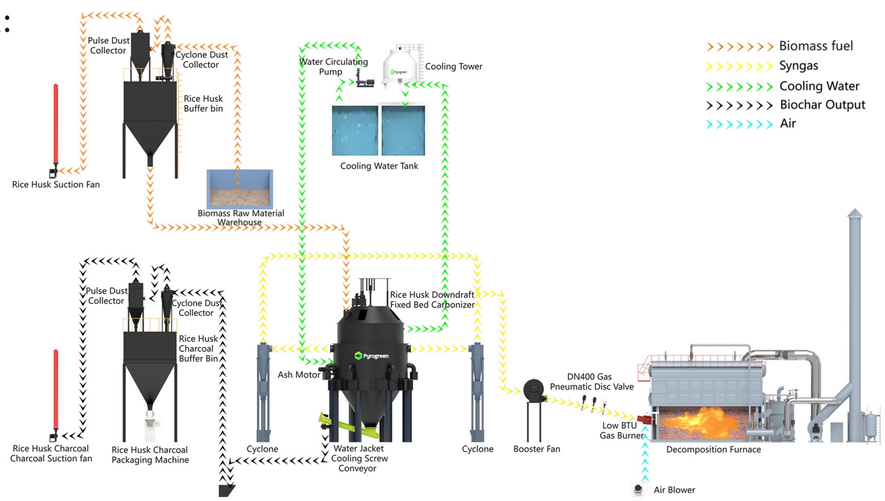

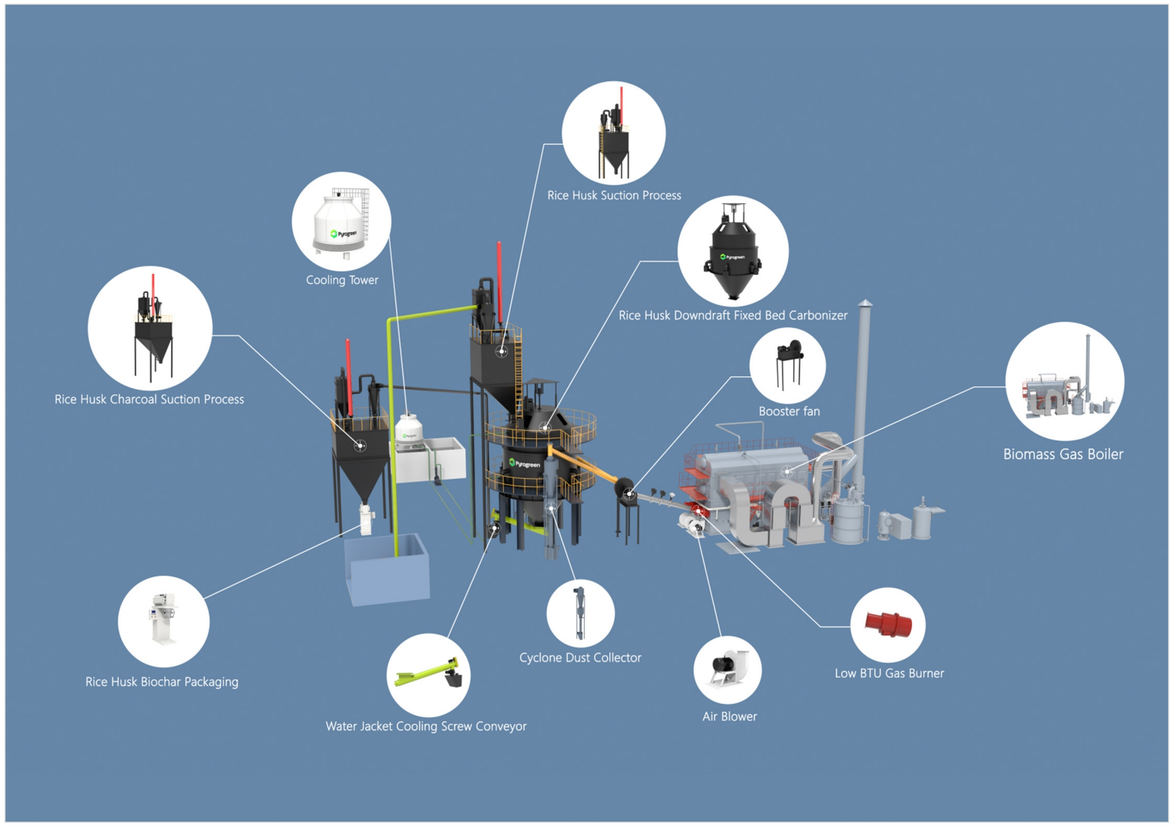

Parameters:

Biomass Downdraft Fixed Bed Carbonizer(DFBC-BC/S)					
Model		DFBC4000-BC/S	DFBC4500-BC/S	DFBC4800-BC/S	DFBC5500-BC/S
Carbonizer Type		Downdraft Fixed Bed Carbonizer			
Range of Biomass Input		Rice Husk, straw, bagasse, peanut shell, wood chips, palm shell and etc.			
Size Requirement		⩽ 10-15mm			
Moisture Requirement		⩽ 15 %			
Biomass Consumption(Kg/H)		800	1200	1600	2000
Gas Production(Nm^3/H)		⩾ 1200	⩾ 1800	⩾ 2400	⩾ 3000
Heat Value of Gas		average 1000 Kcal/Nm^3			
Biochar output (Kg/H)		⩽ 264	⩽ 396	⩽ 528	⩽ 660
Heat Ouput	Kcal/H	⩽ 1,200,000	⩽ 1,800,000	⩽ 2,400,000	⩽ 3,000,000
	KW/H	⩽ 1,395	⩽ 2,093	⩽ 2,791	⩽ 3,488

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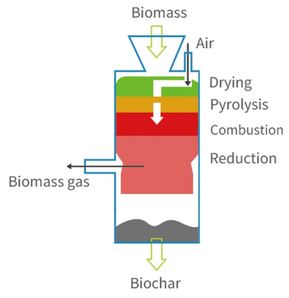
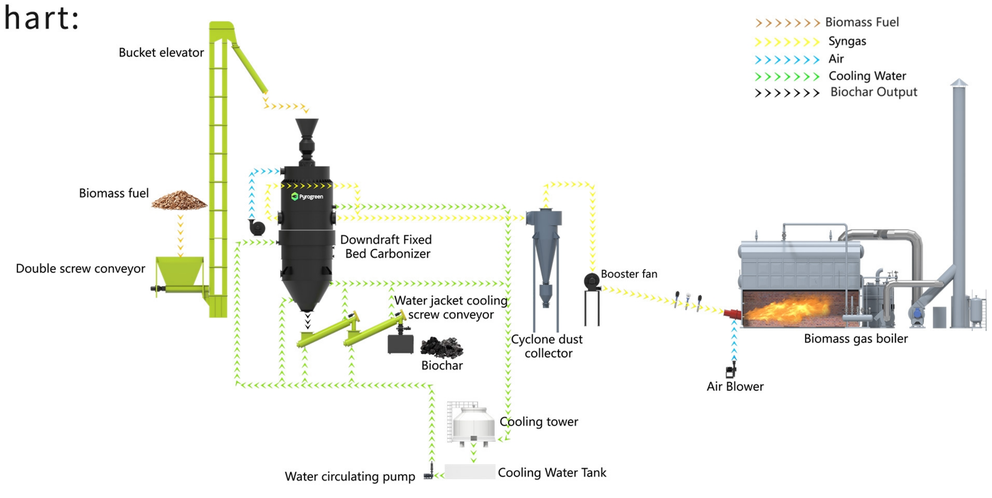
The process:

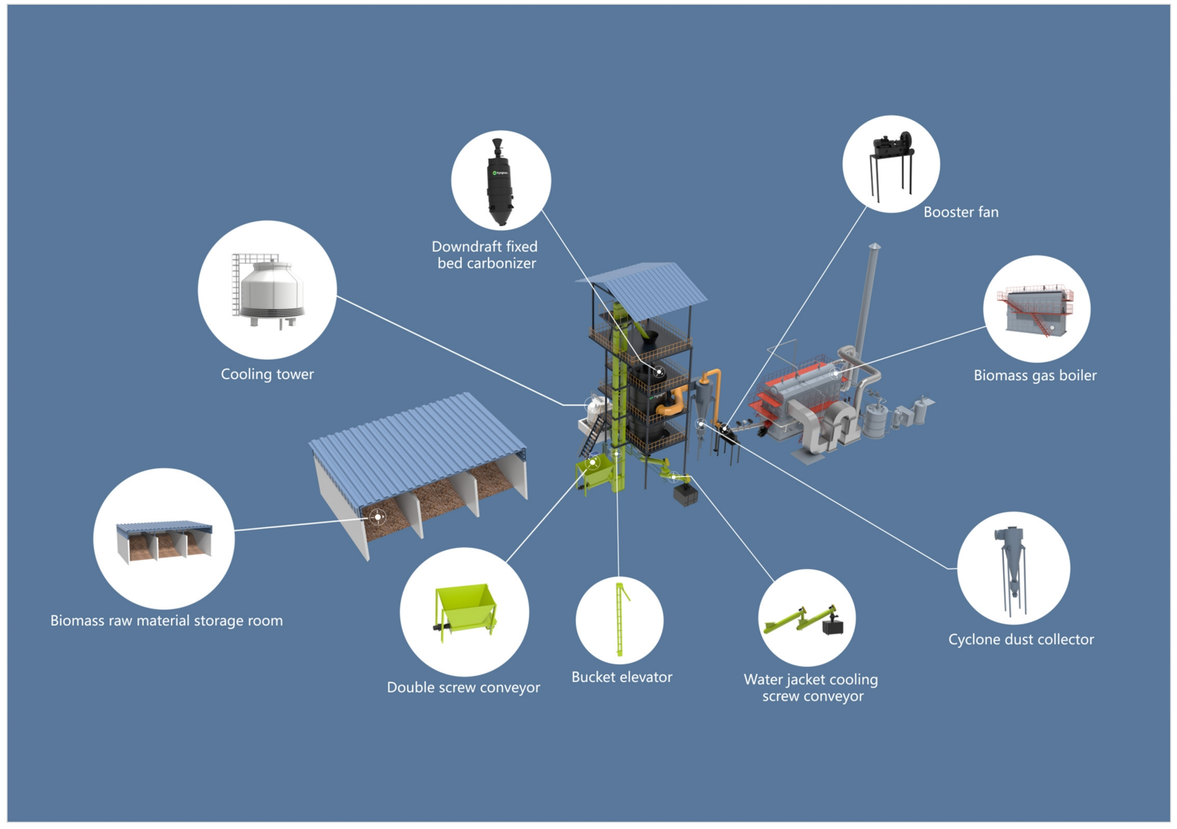
Agricultural and forestry waste such as wood chips, bamboo chips, corn cob, coconut shell and other biomass undergo pyrolysis gasification reaction in the carbonizer with lean oxygen supply, producing combustible gas and biochar. The combustible gas converted from biomass is directly piped and burned in the adiabatic furnace to produce hot flue gas whose heat is exchanged in a waste heat boiler to produce steam (hot water) for residential or industrial use.

Biochar/charcoal is used in our daily life, industrial and agriculture production.



Flow Chart:





Parameters:

Biomass Downdraft Fixed Bed Carbonizer(DFBC-BC/B)					
Model		DFBC1000	DFBC1200	DFBC1600	DFBC2000
Carbonizer Type		Downdraft Fixed Bed Carbonizer			
Range of Biomass Input		Rice Husk, straw, bagasse, peanut shell, wood chips, palm shell and etc.			
Size Requirement		Diameter:20-80mm; Length:20-80mm			
Moisture Requirement		⩽ 15-20%			
Biomass Consumption(Kg/H)		750-1000	900-1200	1200-1600	1500-2000
Gas Production(Nm^3/H)		1250-1500	1500-1800	2000-2400	2500-3000
Heat Value of Gas		1000-1100 Kcal/Nm^3			
Biochar output (Kg/H)		⩽250	⩽300	⩽400	⩽500
Heat Ouput	Kcal/H	⩽1,375,000	⩽1,650,000	⩽2,200,000	⩽2,750,000
	KW/H	⩽1,599	⩽1,919	⩽2,558	⩽3,198

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Carbonization Is A Climate Protection Tool

01 Clean power and heat generation

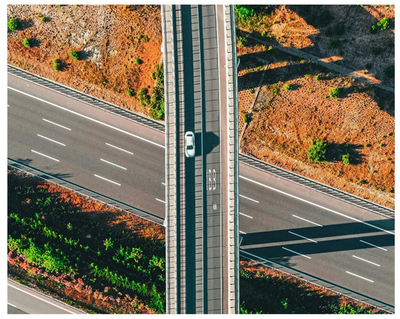
Biochar, in the form of torrefied wood pellets, is the lowest-cost alternative for leveraging sunk investments in existing coal-fired power stations or district heating plants, while reducing GHG emissions by 90%.

02 Carbon sequestration in biochar

The carbon in biochar can be stored in the soil for a long time, which helps slow down the increase of carbon dioxide in the atmosphere and has a certain mitigating effect on climate change.

03 Voluntary carbon market

The production of biochar allows for the generation of high-quality carbon sequestration credits, due to the longevity of carbon storage which is measured in several hundred years.

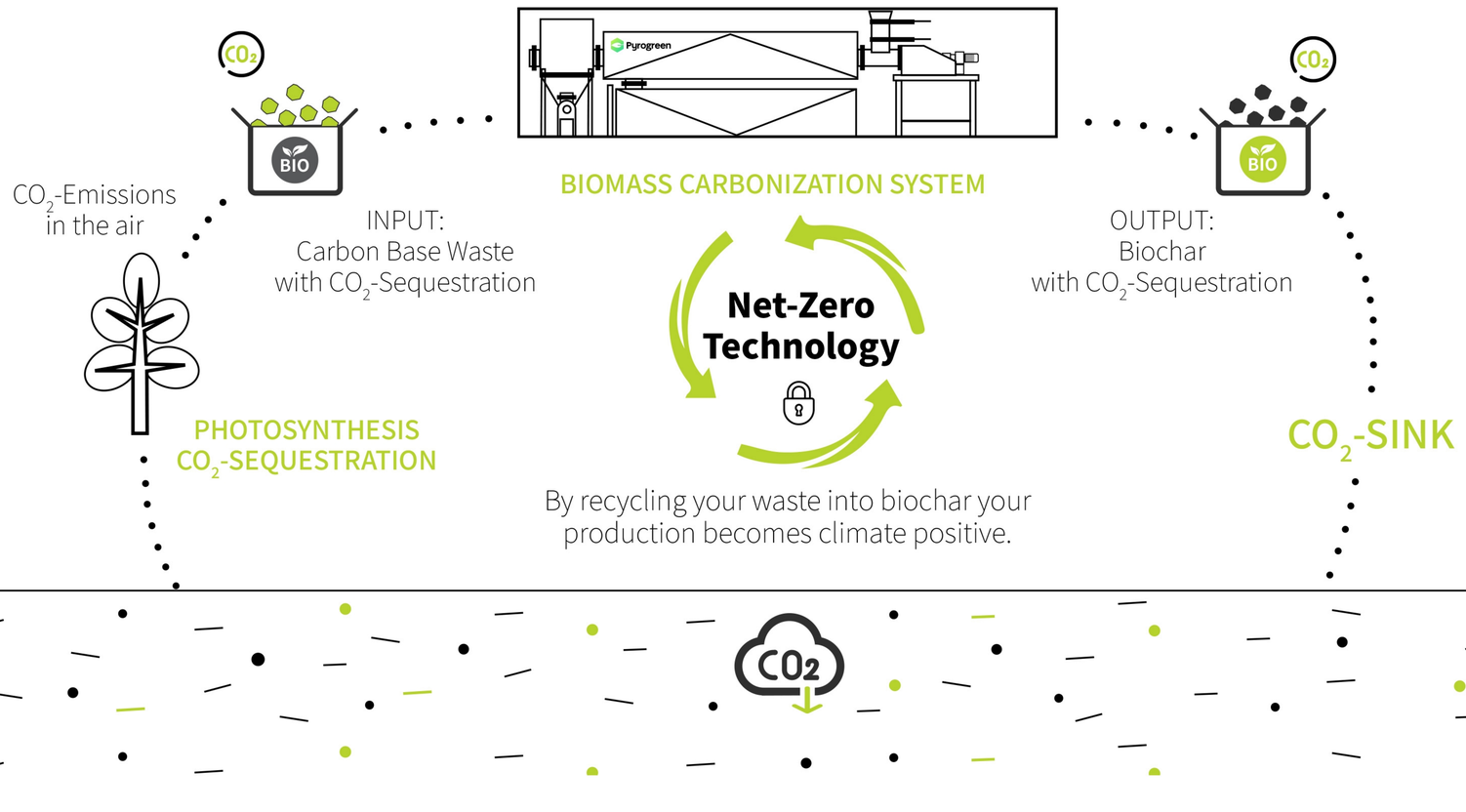


04 Carbon-negative materials

Developing new and sustainable building products with the help of carbon-negative materials is an effective way to decarbonize the construction industry. In addition, biochar is the perfect additive to enhance the performance of concrete, asphalt, aggregates or thermoplastic composites.

05 Green steel and metal production

The metallurgical industry accounts for almost 10% of global GHG emissions. The production of steel, silicon and various other metals implies energy-intensive processes that also require carbon as a reducing agent to remove oxygen from ore. Today, the most common form of carbon used by the industry is fossil carbon from coal and coke.

06 Organic soil amendment

When used as an amendment, biochar improves soil fertility and promotes plant growth, while reducing the need for chemical fertilizers and irrigation. It also improves crop yield by increasing soil aeration and drainage, micro-organism activity and nutrient retention.