EARTH SYSTEMS
Environment · Water · Sustainability

The CharMaker
Making Better Biochar

Conversion of Waste Wood to Biochar

A core expertise of Earth Systems is the development and application of technology for the pyrolytic conversion of biomass to energy and other useful solid and liquid products. The mobile batch pyrolysis furnace, the CharMaker MPP, has been designed, manufactured and patented by Earth Systems to convert woody biomass waste to a high-value biochar product on site.

Earth Systems has developed a new mobile pyrolysis plant (MPP) technology that allows biomass to be converted on-site into high- value biochar products.

Pyrolysis is the high-temperature treatment of woody waste in a low-oxygen environment to produce a special form of char known as biochar, which has a variety of valuable applications.

The mobile pyrolysis plant has a shipping container form factor for simple integration with standard transport methods, making it pos- sible to access stockpiles of woody biomass that would otherwise have required removal and transport for disposal or conversion.

The technology is particularly useful for the treatment of invasive pest tree and plant species, providing a method of complete destruction with minimal risk of spread. A sophisticated thermal oxidiser arrangement also makes the technology suitable for contaminated biomass sources where contaminants can be volatilised and destroyed in the high-temperature afterburner flue system. The MPP units can also be deployed in batteries with a bolt-on bio-liquids recovery system for a longer-term fixed bioenergy hub arrangement.

KEY FEATURES OF THE MOBILE PYROLYSIS PLANT

- Internationally patented technology based on a novel and rapid pyrolysis process for large-sized woody biomass.
- Easily transportable unit with access to most remote areas.
- Batch processing with 13 and 30 m3 internal volume per batch for the MPP20 and MPP40 units.
- Pyrolysis converts biomass to 1–2.5 tonnes of biochar per batch.
- Processes all larger wood feedstocks, including logs. Minimal feedstock pre-treatment is required (no chipping required).
- Batch processing takes a few hours (normally 4–6 hrs per batch)
- Targeted temperature range can be selected (300–550 °C).
- Destruction of all pathogens.
- High-quality char product with a very high fixed carbon content.
- Very low to zero smoke emissions.
- Minimal operating costs: unit operates itself after loading with auto-turn off at end of run, and can be operated unattended.
- Global remote connectivity via smart phone and computer.
- Designed for farm and forestry machinery operation.
- High thermal energy output with capacity for high-grade heat export to industrial processes.
- Bolt on bio-liquids recovery plant also available for pyroligneous liquids (wood vinegar/smoke water) and bio-oil.

RECENT APPLICATIONS

- Conversion of waste willow wood to biochar for waste management as part of an Australian government waterways program.
- Conversion of industrial hardwood flooring to saleable char for a government authority in Australia.
- Safe destruction of contaminated wood products for a major Australian industrial.
- Demonstrations for farming and agricultural use across Australia.

KEY BENEFITS OF BIOMASS TO BIOCHAR CONVERSION

- Reduce waste volumes by up to 90%.
- Carbon is locked in stable biochar to reduce CO2 emissions.
- Depending on feedstock, biochar may be suitable for resale as agricultural, horticultural or activated charcoal.

For more information: thecharmaker.com

What is Biochar?

Biochar is produced from biomass (typically plant matter), and has received much interest for its potential uses in improving soil properties and for capturing and storing carbon. Potential benefits include improved nutrient and water retention, reduced soil acidity, increased cation exchange capacity, and increased habitat for beneficial soil microbes.

earthsystemsglobal.com

AUSTRALIA
enviro@earthsystems.com.au
MELBOURNE
4/290 Salmon Street, Port Melbourne, VIC 3207
+61 3 9810 7500
PERTH
BRISBANE

EUROPE
enviro@earthsystemseurope.com
BRISTOL
Generator Building, Counterslip, Bristol BS1 6BX, United Kingdom
+44 117 373 6153

AFRICA
enviro@earthsystemsafrica.com
DAKAR
3ème étage Route de l'aéroport Ngor, Dakar Senegal
+221 3386 83023
KIGALI
M&M Plaza, 5th floor 24W3 +JCW, KG 8 Ave, Kigali, Rwanda
+250 787 807 499
ABIDJAN
II Plateaux Vallon, Sainte Cécile, Lot 219, Cocody-Abidjan, Cote d'Ivoire
+225 07 89 92 71 13

ASIA
enviro@earthsystemsasia.com
VIENTIANE
Suite 801, Kolao Tower II, 23 Singha Road, Ban Nongbone, Vientiane, Lao PDR
+856 (0)21 454 434
HANOI
5th Floor, No. 85 Nguyen Du Street, Hai Ba Trung District, Hanoi, Vietnam
+84 (0)28 3535 8200
COLOMBO

CHINA
enviro@earthsystems.com.cn
SHANGHAI
Room 1105, Jing'an China Mansion 1701 West Beijing Road Shanghai, China
+86 216 887 2968