Mobile Pyrolysis Plant (MPP-20)  
Conversion of waste wood to char products

A core expertise of Earth Systems is the application of existing and new technology for the thermochemical conversion of various biomass resources to energy and other useful solid and liquid products. One technology designed, manufactured and patented by Earth Systems is a mobile batch pyrolysis furnace intended primarily for the conversion of stranded woody biomass waste. This technology was built for NECMA as part of their ongoing river management operations in north east Victoria, Australia.

A common issue with stranded woody biomass is that mobile plant machinery access issues can preclude successful recovery of the biomass. Transport costs can also undermine the economic recovery of biomass for other purposes. Earth Systems has now addressed this difficult problem by inventing a mobile pyrolysis technology that is easily transportable – the technology goes to the biomass. The pyrolysis technology is based on a shipping container design and hence integrates simply with all standard methods of transport suitable for shipping containers.

Pyrolysis is the high temperature treatment of the woody waste in a low oxygen environment. Pyrolysis can be used to convert woody waste into charcoal or a special form of char known as biochar, which has a variety of valuable applications.

The technology is applicable to any woody biomass where transport or economic issues preclude removal. Alternatively, multiple pyrolysis units can be deployed with bolt-on electricity generation for a longer-term bioenergy hub arrangement. The technology is also 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 afterburner arrangement also makes the technology suitable for contaminant-ed biomass sources where contaminants can be volatilised and destroyed in the high temperature afterburner flue system.

**KEY FEATURES OF THE MOBILE PYROLYSIS MACHINE**

The mobile pyrolysis machine has the following key parameters:

- Easily transported unit with access to most remote areas.
- Batch processing with 15 m³ internal volume per batch. This equates to ~5 to 8 tonne of wood wet basis.
- Pyrolysis converts biomass to ~1.2 tonne char 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 ~4hrs per batch depending on moisture content).
- Targeted processing temperature range can be selected from 300-550°C.
- Destruction of all pathogens.
- Char product has high fixed carbon content.
- Very low emissions.
- High thermal energy output.
- High after-burner temperature minimises volatile emissions.
- Designed for farm and forestry machinery operation.
- Capacity for bolt-on electricity generation unit, as well as thermal energy generation.
- The char product is screened, crushed and packaged at the end of the process on site.

*currently under development

About Biochar

Biochar is produced from biomass (typically plant matter), specifically for use in soil amendment. It has received much interest recently for its potential uses in improving soil properties and also as a simple means for capturing and storing atmospheric carbon.

Potential benefits to soil include improved nutrient and water retention, reduced soil acidity and increased habitat for beneficial soil microbes.

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