

# Biomass-Powered Thermal Processing of Bamboo



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# African Bamboo

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## The Business

African Bamboo is building a vertically integrated supply chain and production facility in Ethiopia for the manufacture and export of bamboo panels and boards for use in flooring and decking.

## Superior Product

AB has developed a production process that yields panels for decking and flooring that are both lower cost and superior in quality to the products currently on the market.

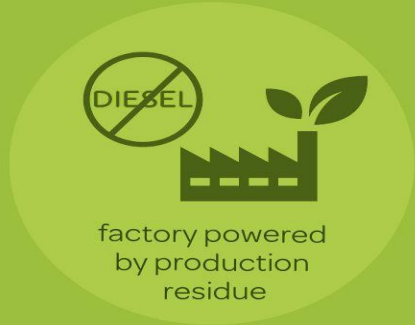
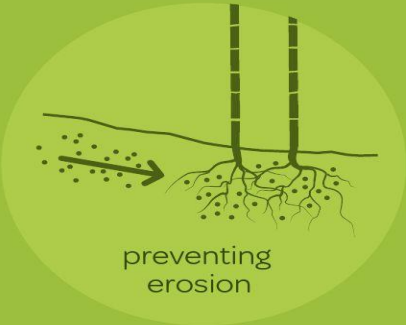
## Positive Impact

African Bamboo will provide a sustainable alternative to tropical hardwood products, create new revenue streams for smallholder farmers in Ethiopia, and recycle process residues for energy generation.

## Production

At full scale the factory will produce 850,000 m<sup>2</sup> compressed bamboo floor boards (2.4m x 1.4m x 20mm) per annum

# our vertically integrated supply chain



environmental benefits



social benefits



# Factory Energy Requirement

To produce 850,000 m<sup>2</sup> per year:

Business-as-usual scenario

Thermal energy demand is 16MWth

Electrical energy demand is 2.3MWe

AB Project scenario

Thermal energy – 7.7MWth

Electrical energy 2.2MWe

- Reduction of pressing cycle duration from 2.25 hours to 0.75 hours results in reduction of thermal energy demand for pressing
- Reduction of curing chamber from 15 days to 3 days
- Innovative glue application methods on thermally treated bamboo fibers by “spray coating glue resin paste” as opposed to “dipping into liquid glue resin tank” totally avoids need to use drying tunnels

# Biomass Combined Heat and Power Plant (CHP)

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## AB's Biomass Combined Heat and Power Plant (CHP)

- Powers the entire production process by generating 12 MW of heat and electric energy
- Several heat generation scenarios were analyzed and compared according to their average price per unit of heat supplied over a time-span of ten years.
- CHP represents the cheapest, most reliable and sustainable way to supply the required amount of energy for the production process.
- Because the process residues are used free of costs to generate the heat and power, not susceptible to price hikes and power outages, and the process residues provide an environmentally-friendly material for the heat and power generation.



# Bamboo Biomass/Process Residues

Created at three points in the production process:

a. Crosscutting

b. Crushing

c. Machining

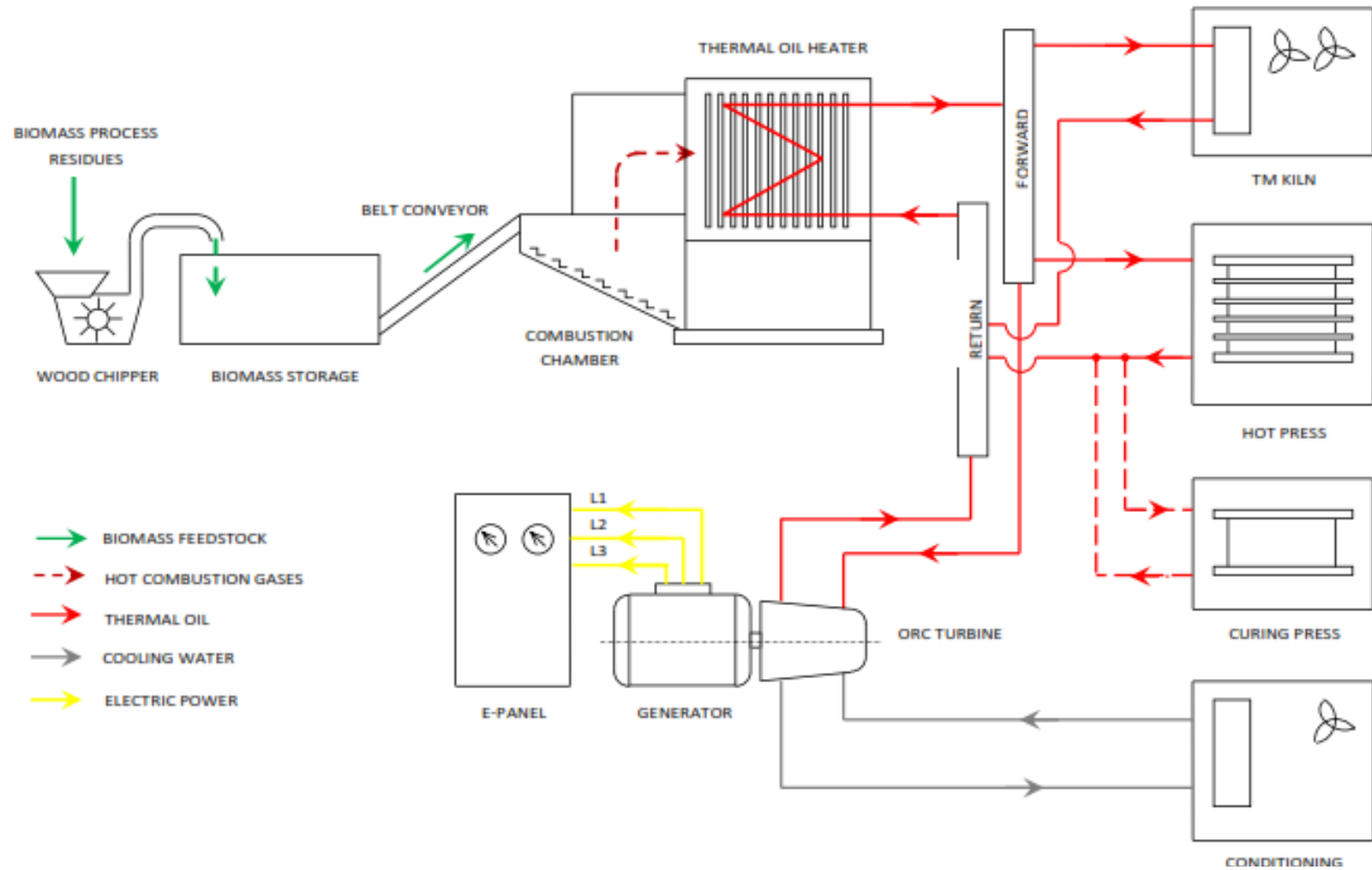


# How it Works?

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- The solid forms of waste from the crosscutting are first put into a wood crusher machine before being fed into the Boiler.
- The Boiler will have a capacity of **12 MW thermal energy** and will be coupled to an Organic Rankine Cycle (ORC) turbine and a generator of **1.2 MW electric energy**.
- The Boiler heats the thermal oil up to a temperature of **300 degrees Celsius**.
- Part of the hot oil is supplied to the production equipment and the other part is supplied to the ORC Turbo-Generator.

Chart of the Biomass Boiler System Design





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Thank You