What is Biomass?

Biomass—renewable energy from plants and animals. Biomass is organic material derived from plants and animals, and this is a renewable source of energy.

Biomass contains stored energy from the sun. Plants absorb the sun's energy in a process known as called photosynthesis. When biomass is burned, the chemical energy within biomass is released as heat. Biomass can be burned directly or converted into liquid biofuels or biogas that can then be burned as fuels.

Examples of biomass and application their uses for energy:

- Wood and wood processing wastes: burned to heat buildings, to produce and process heat for industrial purpose, and to also generate electricity;
- Agricultural crops and waste materials: burned as a fuel or converted to liquid biofuels;
- Food, yard, and wood waste in garbage: burned to generate electricity in power plants or converted to biogas from landfills;
- Animal manure and human sewage: converted to biogas, which can then be burned as a fuel.

Through studies conducted in partnership with MIT (Massachusetts Institute of Technology), in 2016, Tecnored commenced development of technology that enables various biomass to be utilized as fuel in the production of pig iron. The Biomass development took into account some points according to the criteria below:

- Evaluation of potential biomass as raw material;
- Supply chain study including logistics, pre-treatment and production process for different sources of biomass;
- Life Cycle Analysis and Balance of greenhouse gas (GHG) emissions;
- By-product valuation cases such as top gases for energy cogeneration.

Tecnored and Biomass

Tecnored has developed a technology that enables the use of varying sources of biomass, and such procedure is possible due to biomass conversion (pyrolysis) technology combined with the briquetting technology.

Pyrolysis is most commonly employed in the treatment of organic materials. It is one of the processes involved in charring wood or any other biomass. In general, pyrolysis of organic substances produces volatile products and leaves a solid residue enriched in carbon, char. Extreme pyrolysis, which leaves primarily carbon as the residue, is known as carbonization. Pyrolysis is considered to be the first step in the processes of gasification or combustion.
The process is predominately used in the chemical industry, for example, to produce ethylene, many forms of carbon, and other chemicals from petroleum, coal, and even wood, to produce coke from coal. Aspirational applications of pyrolysis would convert biomass into syngas and biochar, waste plastics back into usable oil, or waste into safely disposable substances.

The biomass conversion process uses heat and chemical processes to execute biochar transformation enabling the use of the energy contained in the material. This thermochemical conversion process is known as slow pyrolysis or carbonization.

Studies have shown that replacing thermal coal with biochar in the Tecnored furnace can reduce CO_2 emissions to zero in the pig iron production chain. The photosynthesis and CO_2 absorption in the supply chain is higher than the CO2 emitted during the biomass carbonization (Pyrolysis) process and pig iron production combined.

Tecnored's carbonization (thermo-chemical conversion) plant

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