BIOMASS NETWORKING IN EUROPE

DANISH TECHNOLOGICAL INSTITUTE

Upgrading Fuel Properties of Solid Biomass and Waste by Torrefaction

The use of biomass in large power plants is considerable in Denmark and expected to significantly increase in the near future. The large in-homogenity of different types of biomass is a challenge for the feeding and operation of the power plant.

The upgrading process (torrefaction) that is a heat treatment without air at around (250 – 320˚C) has the potential to mitigate some of the challenges, as it changes the properties of the biomass such as:

- The biomass becomes more brittle, which increases the capacity of mills and lowers the energy demand concerning the preparation of fuel in co-firing
- The energy density of the biomass increases and when pelletized a product with properties close to coal is achieved, which ensures a more cost efficient transport and storage
- The hygroscopic biomass becomes hydrophobic and will thus bind much less moisture, which makes outdoor storage possible

- A less in-homogenous fuel from several different biomasses can be produced
- Potential self-ignition during storage is reduced because volatiles have been removed and microbial degradation has been curbed.

Danish Technological Institute is working on the complex physio-chemical reactions taking place during torrefaction of biomass in lab as well as in bench scale experiments.

This includes evaluating technical and economic potential torrefaction has on the fuel chain from the production site of the fuel on the transport, the storage to the processing at a power plant.

Danish Technological Institute is working with all kinds of energetic utilisation biomass and is involved in several projects in this field. We have specific experience with project management, the conditioning of biomass (i.e. drying, size reduction, pelletizing and extrusion), handling, storage, combustion and gasification of biomass and a quality characterization according to the CEN standards for solid biofuels.

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