Technologies For Biomass Utilization

How and what is presented

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How and what is presented

The material is presented in six different parts

…to create an understanding of the essence of thermo-chemical conversion in ways that are not accessed in current literature – internet based or other books

- To emphasize that getting as high a temperature as possible by reducing the moisture in the biomass and sizing the material suitably in the reactor is vital.
- Why are these important and how much?
- How to arrange the devices to get the best out of them
- Some learning about other developments – what is useful and what can be ignored?

The crucial aspects –

- Create a mix of fuel vapors and air before combustion – premixed mode.
- If this cannot be accomplished completely, create as much as possible
- These define the quality of the flame
- Blue flame is not necessarily the only aim, nor is a bright orange color flame bad. The presence of sodium and potassium salts generates these colored flames. They may actually add to radiant heat transfer

The crucial aspects…..

- The combustion process must ***not be kept*** far away from the device to which heat is to be transferred.
- If this happens, you loose in terms of utilization efficiency.
- Therefore, light biomass will inevitably lead to lower utilization efficiency as the volume required to store may be large. Densifying the biomass helps a great deal – really a great deal.

The crucial aspects…

- Quite often, there is an expectation that use of as-received biomass has greater acceptability and this criterion is loaded on to the design.
- Following it can lead to results that vary from poor to unacceptable results.
- One must remember, the crude oil that is mined is not directly used in engines – The crude oil is refined. So should it be for biomass.
- Two refinements to biomass are – reduction of moisture and size.
- Emphasis is on understanding the behavior and not simply to find formulae to be used for design.