

TORBED* Energy Technology Application Description

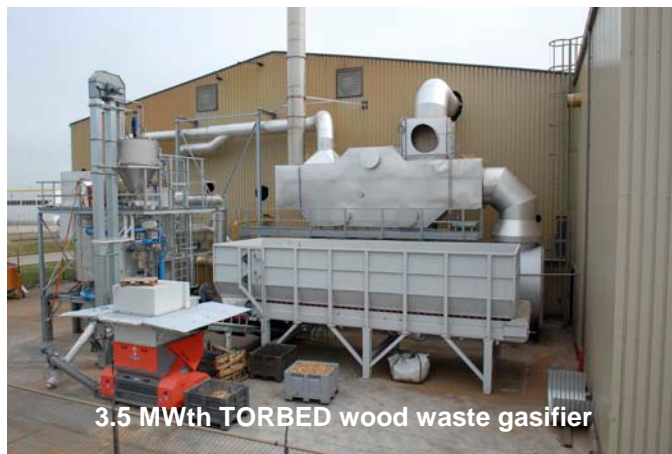


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ENERGY PRODUCTION FROM BIOMASS WASTES

Throughout the world, there are massive quantities of lignocellulosic wastes generated as a result of manufacturing processes which turn trees and other vegetative growth into lumber, paper and food products. These wastes that are generated centrally during the manufacturing process, are more conveniently used as an energy resource than are the wastes from harvesting that are scattered, normally left in field or forest.

Since the alternative to utilization of these wastes is disposal to land where they will slowly degrade and ultimately generate carbon dioxide and other greenhouse gases, there is the potential for real savings in greenhouse gas emissions if these wastes are used to generate energy to replace energy generated from fossil fuels.



Many of these potential energy resources are either small in particle size and light and 'fluffy' (e.g. sawdust, rice husk, wheat chaff) or physically heterogeneous in size range (e.g. mixed wood waste containing sawdust, bark and off cuts). These physical characteristics often make them difficult to handle effectively in conventional combustion equipment.

Some wastes contain potentially valuable inorganic ash. For example, with the ash produced from rice husk, it is critical to maintain a very controlled combustion or gasification temperature to avoid causing undesirable changes to the morphology of the ash.

TORBED Energy Technologies are ideally suited to torrefy, pyrolyse, combust or gasify coarse and mixed size wood waste streams after a minimum degree of size reduction, e.g. coarse shredding. TORBED units can handle the elongated product of primary wood shredding simultaneously with sawdust. The

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temperature within a TORBED unit can be controlled precisely so that where there is sensitivity to temperature for a potentially valuable inorganic ash by-product, adverse effects are avoided.

TORBED units are operating commercially in Europe torrefying, gasifying and combusting a range of wastes to generate energy

When applied to combustion and gasification, the unique properties of the TORBED Energy Technologies include:

- ☞ Ability to receive a wide range of particle sizes e.g., shredded, chopped, milled, ground and mixed feeds
- ☞ Ability to retain fine fractions ensuring very low carbon ashes
- ☞ Close temperature control for production of more valuable ashes
- ☞ Compact plant with a high throughput per unit volume thus occupying a small foot print
- ☞ Factory assembled to minimize site installation infrastructure and costs
- ☞ Low NO_x due to rapid and turbulent mixing in the process chamber
- ☞ Low pressure drop to minimize electrical consumption
- ☞ High turndown ratios are routinely achieved

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