COMIM SRL

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GASIFICATION PLANTS FOR:

- WOODEN BIOMASS
- WASTE
- BIOCHAR PRODUCTION

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Comim srl, since 2015, began a collaboration with Fenergia s.r.l., a company who has developed a specific know-how in the processes of converting alternative solid fuels (agricultural by-products and waste with high calorific value) into a combustible gas to be used in engines for **the production of electric energy, directly in high-temperature industrial processes, or potentially for the extraction of contained hydrogen.**

Why gasify

Gasification has two fundamental advantages over direct combustion, which are particularly important in small-scale installations:

- **better emission control**
- **greater electrical output**

Gasification in two stages

The transformation of solid fuels into synthesis gas always occurs in two distinct and consecutive phases: pyrolysis, and gasification of the pyrolysis products.

Pyrolysis generates gas, carbon residue and especially tar. All these products in the following gasification must be converted into H2, CO, CO2 and CH4.

The gasification phase occurs through the reaction of the pyrolysis products with the oxygen in the air and with the ever-present vaopr. For gasification to be effective it must ensure that the entire mass involved reaches temperatures of approximately 1000 °C.

What distiguishes our process is that **pyrolysis and gasification take place in two separate equipment**, this allows us to destroy practically all the tar, simplifying the subsequent final cleaning phases.

Materials treated

The two-stage process allows its application both to classic wooden materials, such as **low-quality wood chips of varying sizes**, and to waste materials essentially **composed of plastic and paper/cardboard**. The machines that treat wood chips and waste are conceptually the same but mechanically different. They were tested on a pilot plant, paper mill pulp and RDF.

Sizes

Wooden biomass systems start from a minimum size of 200kWe, the single module can reach a maximum of 350 kWe. Waste systems, on the other hand, start from a capacity of around 400-500 kg/h and can reach up to 1000 kg/h

the systems are however completely automated and can be monitored remotely

Products of biomass gasification: biochar or ash

The basic version of our 200 kWe wooden biomass gasification plants can produce approximately 700 kg/day of biochar, characterized by a grain size of a few mm and a very low IPA content. Upon request, it is possible to equip the systems with a third exhaust stage capable of gasifying the biochar and essentially extracting ash.

If the customer requests it, it is possible to build **plants dedicated to the production of biochar**, based only on the pyrolysis reactor, and on a subsequent activation of the residue, capable of providing for each kg of wood (20% moisture content) approximately 0.2 kg of high-quality biochar, and 5MJ of usable heat.

Installations Built

Wooden Biomass

- Avigliana (Italia) 200 kWe start of production 2020
- Belluno (Italia) 200 kWe coming in 2024

Waste

- Avigliana (Italia) 2016 pilot plant 70 kg/h for testing
- Demo plat, 100 kg/h, currently under construction

Auxiliary Equipment

Comim srl is able to internally design and build moving floor storage/handling systems, transport augers and belt dryers for biomass