

Biomass and RDF (Residue Derived Fuel) Gasification and Production of Electrical Energy by the Help of Turbo Machine - EZOB

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Gasification has a great advantage compared to common burning methods: Biomass and especially straw include considerable amount of alkali that significantly lower temperature of ash melting and limit the temperature of combustion. Gasification of biomass or waste leads to trouble-free burning at high temperature, and produce electrical energy efficiently. At gasification process, significant part of heavy metals stays in ash. For this reason, they won't be released with energogas and subsequent exhaust gas, as it is usual in classical burning process of biomass or wastes. Gasification makes it possible to use not only different forms of the biomass but also so-called residue derived fuels (RDF) – energogas will originate from most of energetic usable wastes (incl. plastics) after gasification.

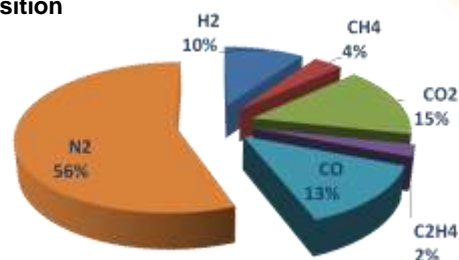


Project description:

A new type of combined heat and power unit will be constructed. It consists of single shaft turbine-generator unit, where pressure air of compressor is exchanged. In combustor, energogas is warmed up to 900 °C and subsequently expanded in turbine. The 450 °C air that is expended in turbine is used for gasification and combustion. In this case, energogas need not to be cooled down or even cleaned from tar dust before combustor. To increase the application of energogas in this project, it will be needed to modify the PBS turbo generator unit NETZ – result of previous projects. Ateko will adopt one unit for proposed gasification chamber, however two parallel units will be probably used in future. Supposed electric output in this system will be $2 \times 75 \text{ kW}_e = 150 \text{ kW}_e$. Great advantage of turbine-generator unit type NETZ will be that the turbine works with heat by air, no burnt gas, which has very positive influence over its service life.

Energogas properties: Heating value 4–6 MJ/m³

Composition



Turbine-generator unit type NETZ



Gasification unit

The configuration of unit EZOB for some turbine-generator unit by electrical output 100 kW will work up 700 t raw materials yearly, from which will put out 700 000 kW/h, at supply to the nets will sales 80 000 euro per year. It will produce 300 kW_t in form hot air and heating waters.



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