



biomass technology group

Biomass consultants, researchers and engineers

BTG Biomass Technology Group BV is a private firm of consultants, researchers, and engineers, operating worldwide in fields of sustainable energy production from biomass and waste

P.O. Box 217 > 7500 AE Enschede > The Netherlands > Tel +31 53 486 1186 > Fax +31 53 486 1180 > Email office@btgworld.com > Site www.btgworld.com

RICE HULL COMBUSTION

BTG has developed a low-cost 500 kW thermal rice hull combustion system to generate heat for industrial heating. The two-stage system has been specifically designed for developing countries. The technology was first being used in Columbia and Costa Rica and has been further improved and tested in Bolivia. The technology is interesting for its good performance, local manufacturing possibilities and its potential to substitute conventional fuels.

Technology description

The system consists of the following main components:

- Feeding system ? Combustion chamber
- Air supply ? Heat exchanger
- Chimney

Rice hull enters the combustion chamber at the top and moves downward over a fixed hot bed by gravity. The two-stage technology refers to two air inlets ports; primary air is coming through small holes entering at the bottom of the bed. Secondary air enters above the bed and ensures complete combustion. Hot combustion gases are led through a heat exchanger and heats up ambient air to 100 – 200 °C dependent on the application. The resulting hot air is led into the dryers using existing or – if necessary – additional blowers.



Burning rice hull



Drying ovens in Costa Rica

For drying rice, like in Bolivia, the best results are obtained with high drying air flows (some 25,000 m³/hr) at low temperatures (leaving the oven at some 100 °C and further brought down by mixing with environment air to 60 °C).

Status of the technology

The technology is fully commercial available in Columbia and Costa Rica. BTG has improved the design and is currently introducing the oven together with local manufacturers in a number of other countries. By adjusting the secondary air flow, a wide range of temperatures can be maintained making the concept flexible for many applications.

Economy

Costs of one 500 kW_{th} oven are around €15,000 – 20,000, depending on local costs of materials and transport, costs of feeding system, dryer connection and necessity for additional air suction. Depending on costs of conventional fuels, the investment typically pays itself back in 2-3 years.

Reference projects

Design and construction of rice hull combustion oven for rice drying in Yapacani in Bolivia



Oven to dryers connection in Bolivian rice mill



Rice hull oven in Yapacani in Bolivia

Contact

Frans Feil
BTG biomass technology group B.V.
P.O. Box 217
7500 AE Enschede
The Netherlands
Tel.: +31 (0)53 489 28 97
Fax: +31 (0)53 489 31 16
E-mail: Feil@btgworld.com
Web: www.btgworld.com