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biomass technology group

Biomass consultants, researchers and engineers

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

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Cookstoves

In developing countries, -with an emphasis on Africa-, over 80% of the households depend on fuelwood for their cooking. More efficient cookstoves can therefor influence and improve the daily lives of an enormous amount of people.
Improved cookstoves can play a role in poverty alleviation (through reduced fuel consumption), improved living conditions (reduced smoke emissions, reduced fuel collection times etc.) and have an environmental impact as well (reduced emissions and deforestation).
As examples of successful cookstoves projects the Kenyan Jiko, the Ethiopian Mirth, the Rwandan Rondereza and the Malian Mai Sauki can be mentioned, where BTG has played an important role in the last two projects.

In the view of BTG the point of departure for work on cookstoves is to look at a cookstove as part of a **system.** This system consists of three main components, which bring their own specific considerations:

- Consumer (social) considerations
- Engineering considerations
- Development and ecological considerations.

Each of these components is equally important -and often mixed- and when developing an improved cookstove project (meaning the introduction of fuel-efficient stoves in a sustainable way), all these considerations should be taken into account.

Under **Social Considerations** we can group the following items:

- market studies (before dissemination)
  - ✓ foods, cooking habits, stoves used, pans used, fuel supply, fuel consumption, fuel prices, expenditure patterns, family composition, comfort, consumer acceptance trials
- market studies (after dissemination)
  - ✓ fuel consumption, consumer acceptance, consumer panels, permanent, evaluation systems
- stove production
  - ✓ materials, models, artisans, production tools, artisan organisation, co-operatives stove marketing, existing marketing channels
- safety and health
  - ✓ stove emissions, burn hazards, fire hazards

Engineering Considerations

- combustion technology
  - ✓ type of fuel, oxygen demand, excess air, grates, dampers, flame height, heat of combustion, power, efficiency, chimney
- stove testing
  - ✓ testing methods, test results analysis, stove improvement, fuel consumption, fuel consumption calculation models

Development and ecological considerations

- economics
  - ✓ fuel costs, pay-back, cash-flow and IRR,
- fuel economy
  - ✓ fuel savings,
- ecology
  - ✓ sustainable yield, forest management, CO2 reduction, agricultural waste, densification, agglomeration, charcoal production

Figure 1: Example of an improved charcoal stove, Madagascar.

The **fuel savings** that the use of improved stoves can bring about range from 25% to 35%. In the -not uncommon- situation where a household spends 10% or more of its income on cooking fuel, this means an important alleviation of the continuous pressure on the household budget.

The **benefits for users** of the improved stoves are multiple. Although they have to invest about twice the amount as for the traditional stove (€ 5.- to € 10.-), the payback time will be 1 to 3 months on a stove lifetime of about 12 months. In the situation where a family buys the fuel, the introduction of improved stoves means saving money, which can be used for other important expenditures like food, clothes, school, etc. In the situation where the fuel is collected, the introduction of improved stoves means more time for other chores like agriculture or a money generating activity (pottery, basket making, fish drying, etc.).
Finally, less fuel consumed also means less pressure on scarce forest resources as well as lower CO_2 emissions.