PRACTICAL ACTION
Technology challenging poverty

Briquetting
Fact Sheet

George Kamau/Practical Action

ABOUT US

Practical Action is an international development agency working with poor communities to help them choose and use technology to improve their lives. Our work in Africa, Asia and Latin America is in partnership with poor people and their communities, building on their own knowledge and skills to come up with innovative, sustainable and practical technological solutions. Our work is people focused, locally relevant, environmentally sensitive and offers tangible ways out of poverty. Through our work, we demonstrate alternatives, share knowledge and influence change. Our main areas of work in the Eastern Africa region are; i) Universal Access to Energy, ii) Food Security, Agriculture & Disaster Risk Reduction and iii) Urban Services: Water, Sanitation and Waste Services. Integrated into our work is a commitment to climate change adaptation and mitigation, Market Systems Development, gender equity and social inclusion, and communicating our learning and knowledge through our Practical Answers Programme. Practical Action Consulting plays the important role of replicating knowledge and practice generated from the programmes and external assignments to partners.

Biomass fuel Briquetting technology and the business opportunities

What are Biomass Fuel Briquettes?

Fuel briquettes are blocks of compressed biomass material such as farming waste, charcoal dust or waste paper. They are used for fuel in households for cooking, water heating, and space heating. In Kenya, people use firewood and charcoal for cooking. The prices of firewood and charcoal have been increasing drastically, making it less affordable for most users. Briquettes are a proven technology that provides a low cost fuel for households that is locally made and an alternative to wood or charcoal. Fuel briquettes can also be used in institutions for large scale cooking, and in industries for productive use.

How are Biomass Fuel Briquettes made?

Biomass briquettes are made by pressing loose biomass residues, or waste, to produce compact solid blocks of different sizes and shapes. They are made by applying pressure, heat and binding agent to the loose materials to produce the briquettes of different shapes and sizes. The size and shape can be designed to match the market needs. For household use, a high surface area will enhance burning and reduction in harmful gases and smoke. Fuel briquettes can be made manually or by machines.

What are the different types of briquettes?

Two types of fuel briquettes exist in the market;

1. **Non-carbonized fuel briquettes**. These are produced from waste materials that are not carbonized such as saw dust, and waste paper.

2. **Carbonized fuel briquettes**. These are made from waste materials that have undergone carbonization such as charcoal dust, or carbonizing non-carbonized briquettes.

Why use briquettes?

- Using fuel briquettes means less firewood to collect and charcoal to buy, this saves you time and money. Fewer trees will be cut down which saves Kenya's forests.
- If you make your own briquettes from waste materials you save time and money
- You can make money from selling waste materials for making briquettes, or from making and selling fuel briquettes
- Briquettes mean less rubbish in the streets and in dumps which improves hygiene around your home and your town.

Biomass materials that can be turned into fuel Briquettes

The waste biomass materials available in our environment that can be used to make the fuel briquettes include;

- Charcoal dust
- Waste paper and cardboard
- Waste from bio-product industries like sawmills, plywood industries, furniture factories
- Invasive plants such as water hyacinth, lantana camara, *prosopis juliflora* (Mathenge)
- Agro-processing residues – coffee husks, coconut husks, macadamia nut shells, croton nut shells, wattle bark residues, maize cobs, bagasse, peanut husks, rice husks
- Agricultural residue – maize stovers, leftover leaves, grass, stems and straw from agriculture (if not needed for soil improvement)

Make sure that the materials you are using in making fuel briquettes are safe to burn inside homes, so do get advice about this before getting started.

Charcoal Briquette Ingredients and Composition

To make the fuel briquettes you require the following categories of raw materials:

Heat fuel. This has the highest energy content and is the one that constitutes over 90% of the briquette. This includes; saw-dust, charcoal dust, coconut husks, etc. The higher the percentage of heat fuel materials, the better the briquette.

Accelerants. Briquettes need accelerants to burn faster unlike ordinary charcoal because there is a difference in the structure of fuel briquettes from that of the charcoal. Examples of accelerants include fermented sawdust or pulped waste paper.

Binders. These are materials added to heat fuel and accelerants to draw them together in such a way that it maintains a uniform consistency. The best binders are starch, and gum Arabica or acacia gum starch (cassava, corn, and potatoes), pulped waste paper, red soil, ball clay and molasses.

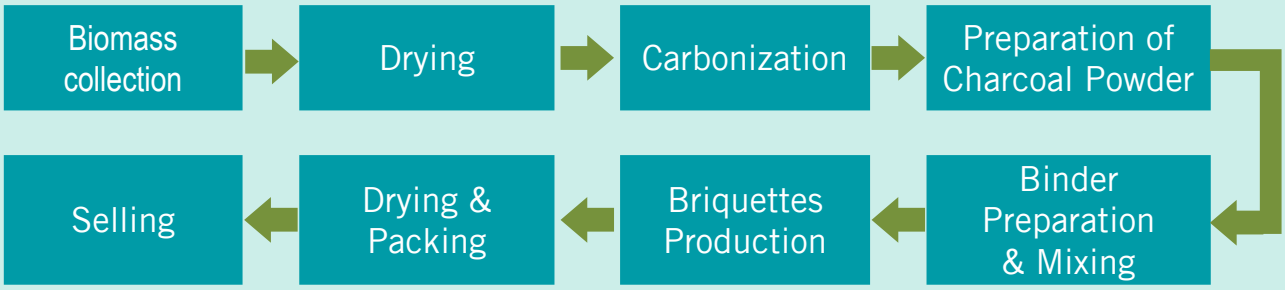
Fillers. These are used to increase the weight, density or volume of the briquettes. Examples are; ball clay, soil and ash. They do not add energy value to the briquette.

Briquette Pressing Machines

To make briquettes you can use the following presses: manual or motorized screw, manual or motorized piston and lever press.

Procedure of producing carbonized briquettes (Charcoal briquettes)

These are the steps to produce carbonized briquettes



Business Opportunities along the Briquette Value Chain

- Collection and sale of raw materials to producers
- Production and sale of briquettes at wholesale level
- Buying briquettes from producers and selling as a retailer or packaging briquettes for the mainstream/ supermarkets
- Fabrication and sale of briquetting machines
- Production and sale of briquette burning cook stoves
- Conducting training on briquette production for people interested in producing

Promoting this technology in the region:

The Briquette Commercialisation Project: Turning Waste to Energy is implemented by Practical Action (Eastern Africa Regional Office) in partnership with ETC Foundation. Its purpose is to increase access to sustainable, affordable and clean energy services to men and women who are un-served or under-served in slums and peri-urban areas of Nakuru and Nairobi by supporting production, marketing, adoption and use of briquettes by the households and catering establishments. The project also seeks to increase employment opportunities by supporting development of male and female owned small scale enterprises producing and marketing briquettes.

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EEP PRACTICAL ACTION Technology challenging poverty ETC FOUNDATION

For more information please contact:

Practical Action - Eastern Africa Regional Office
Methodist Ministries Centre, Office Block C, (1st Floor.)
Oloitoktok Road, off Gitanga Road | P.O. Box 39493 - 00623 Nairobi, Kenya
Telephone: +254 20-2595311/12/13/14/15/16
Email: kenya@practicalaction.or.ke

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