Urban and rural households in low income countries rely on traditional biomass fuels such as charcoal and firewood for cooking and heating purposes, which has an adverse effect on forest resources and on people’s health. A major reason for people to continue these as main sources of fuel for cooking is lack of affordable and reliable alternative sources of energy. Briquettes present a great opportunity to replace traditional biomass fuels for domestic and institutional cooking and industrial heating processes. Through designing and implementing a viable briquette business model, we emphasise that there is a commercial case for the briquette business in Ghana.

The transformation of organic wastes such as municipal solid waste, market waste and agricultural residues into briquettes, using simple and low-cost technology, has the potential to enhance sustainable development while raising the living standards of the poor in developing countries. Briquettes are an affordable source of energy and can be produced in different forms and shapes for different end uses. The viability and sustainability of the briquette business depends on designing sustainable business models that are cognisant of the existing policy and institutional frameworks, the needs of target end users, acceptance of briquettes by potential users and more importantly the affordability of the briquettes compared to the traditional firewood.

IWMI in partnership with private sector enterprises is designing and implementing a briquette business model in Ghana. To that end IWMI and partners investigated the market environment for the briquette in Ghana with the objective to identify potential market segments. Our study framework is best described as a sequential step-wise approach as shown here:

**Policy environment in Ghana**
Policy support is a key initial driver of the success of any industry and in proposing briquetting of biomass as a sustainable solution to the energy challenges in Ghana, the existence of adequate policy, institutional and legal frameworks is important. Ghana has a number of policies, regulations and institutions in place that support the sustainable use of biomass resources, although biomass briquetting is seldom mentioned. Most of the policies emphasise and encourage the sustainable use of firewood through the introduction of modern technologies that enhance efficiency in the exploitation of biomass resources, introduction of efficient cooking stoves and having a designated area for woodlots, as opposed to promoting biomass briquettes as a replacement for firewood and charcoal.

**Briquette enterprises in Ghana - do they exist?**
Although several biomass-based energy projects have been undertaken in Ghana with various degrees of success, briquette businesses are not common in Ghana. A few briquette-manufacturing companies, such as Abellon Clean
Energy Ltd. and Esereso Carbon Products Ltd., have started operation in recent years with a target to export the product to Europe and India.

**Briquette business model – joint venture**

The briquette business described in this article is to be implemented as a joint venture between two private sector enterprises, Jekora Ventures Ltd., a waste management organisation servicing the Greater Accra region, and Volta Ghana Investment Ltd., a real estate company operating in Ghana. The key funding principle of the business will be the setting up of a fee-paying waste collection service to communities, and then converting the organic waste into briquettes which are to be sold to different end-users. The value proposition of the business model is that it provides target clients with environment-friendly briquettes that are cheaper than charcoal and firewood. The type of briquette envisaged to be produced by the joint venture is a non-carbonised type, suitable for institutional, commercial and industrial heating processes. Depending on the needs of the different target customer segments, different value propositions using proper channels of reaching each customer segment can be designed.

The briquette business model developed shows key resources, partners and activities required to make the business work. In addition to the resources and activities required for production and selling of briquettes, there is a need for research and development to harness technical and operational competencies and to enable the business to make briquettes that have a standard energy value and consistent properties. Experience from briquette businesses...
Women fish smokers

Many engage in smoking fish in the Greater Accra region along the coast. Smoking of fish is carried out using traditionally manufactured stoves and firewood. The kind of stove used by these women may not support the efficient burning of briquettes and this may therefore require the business to supply complimentary briquette-burning stoves. At present firewood is the only fuel source used to smoke fish. It is sourced from surrounding villages and sometimes as far as Kumasi. At Nungua where one can find about 50 fish smokers located in one place, the wood is bought in logs and is then split into smaller pieces, a process that requires a lot of labour.

Batik manufacturers

Batik is a traditional fabric that is manufactured using indigenous technology that involves waxing and dyeing. Large drums of hot water are used in dewaxing the fabric after dyeing it. All the batik manufacturers visited use firewood in heating huge drums of water using traditional three-stand stoves.

Institutions: senior high schools

Boarding schools that accommodate their students prepare food on large scale. Most of these schools do not depend on a single energy source but on a combination of liquid petroleum gas (LPG) and firewood. Some of the schools source firewood from woodlots on the school’s premises at no cost while others buy it. The latter expressed interest in the use of briquettes if it will give them a cheaper and more efficient energy source compared to firewood. There are also schools with biogas installations and these are not considered as potential market segment for briquettes.

Potential market segments for briquettes

Various customer segments were identified as potential target clients for briquettes. These include households, institutions such as high schools and private universities, small and medium scale enterprises, industrial users such as steel product manufacturers, cement factories and breweries. However not all of these segments were found to be suitable for briquettes due to their energy needs, current source of energy and the existing type of stoves used. Customer segments such as fish smokers, senior high schools and Batik manufacturers were found to be promising customer segments for briquettes and therefore warrant further studies in order to assess and quantify demand.

Business opportunity

There is a huge untapped market for briquettes in Ghana. Although a systematic approach was used in identifying potential customer segments, the identified segments are not exhaustive and there may exist other viable potential customers for briquettes. These may be either within the cities or even more importantly outside the cities where use of firewood is most dominant. One noticeable fact across most of the potential market segments reached is that most consumers lack awareness and knowledge about the existence of briquettes. Thus, an awareness campaign program needs to be carried out to familiarise target segments on the benefit of using fuel briquettes, including a demonstration of the performance of briquettes in comparison to alternative cooking fuels.

Solomie Gebrezgabher and Sena Amewu
International Water Management Institute (IWMI)
s.gebrezgabher@cgiar.org

Acknowledgement

This research study was initiated as part of the project entitled Creating and capturing value (CapVal) funded by the Ghana Wash Window and the CGIAR Research Program on Water, Land and Ecosystems (WLE).