

Burn – Manufacturing Lessons Learned

Organization Profile

- Year Established: 2011
- Countries of Operation: Kenya
- Headquarters: USA
- Type of organization: For profit cookstove manufacturer
- Product(s) – jikokoa™ <http://catalog.cleancookstoves.org/stoves/214>
- Grant type and date of award: Spark Fund Round I (PIF), 2013

Organization Overview

BURN Manufacturing Co. is an affiliate of Burn Design Lab, a stove design company based in the USA. In 2011, BURN Design Lab's CEO, Peter Scott and his partners made the mad the decision to move from a design firm a manufacturing company. Burn had designed stoves for years but noticed that many stove companies were unwilling or unable to pay for design expertise and was anxious to get quality products to consumer faster.

BURN received investments from General Electric, Acumen Fund, United States Overseas Private Investment Corporation (OPIC) and support from the Global Alliance for Clean Cookstoves and The Energy and Environment Partnership Programme (EEP) to create a state-of-the-art manufacturing facility. Today, BURN has a fully operational manufacturing facility and continues to sell their jikokoa product at increasing volumes. They have also received support from investors to introduce a second product to their line.

Grant Objective

BURN's goal was to establish a full manufacturing facility in Kenya, know that it would be challenging to import stoves from China into Africa with high import tariffs, long lead times to receive inventory leading to potential stock outs, and long cash cycles that would slow their growth. Their team planned an ambitious two-phase set up of a full manufacturing facility in Kenya. OPIC and GE's funding was allocated for Phase I- assembly facility.

BURN's Spark Funds were allocated to Phase II- moving from assembly line to full production through capital expenditures on machinery as well as improving the capacity of financial management in Kenya and the US. Once full assembly was established in the country, BURN would order machinery from China, fine tuning and tooling machinery in their facility in Vashon, Washington and then transporting machinery to the factory in Kenya.

Activities and Achievements of Grant

BURN's ambitious plan was to be implemented in the course of 12 months. Though it took closer to 24 months to complete, today BURN's facility in Kenya employs 100+ people - more than half of whom are women - and produces a stove every minute. In the last 2+ years Kenyan consumers have spent more than \$5 million to purchase 135,000 jikokoa cookstoves. These stoves have helped consumers save more



than \$15 million in reduced fuel costs and 289,000 tons of wood. Two years after the grant, BURN now manufactures a stove a minute in their Kenyan factory and has secured a [follow on investment](#) from [Acumen](#) that has helped them reach their short term target of 10,000 stoves per month and achieve their long term goal of providing 3.7 million cookstoves to families in the next 10 years.

In 2013, BURN found a facility that would allow them to set up an assembly line and began importing flat packs of the jikokoa into Kenya. The facility was located at a greenfield site and BURN had to make a significant time and financial investment to prepare the site for the factory. BURN started out with just the shell of their factory – there was little infrastructure and no viable roads making it difficult to produce and disseminate jikokoas. Once the factory build out was complete, the Spark grant allowed BURN to purchase all of their equipment at once and moving to full production in a matter of months.

BURN's stoves are made in a modern, continuous flow manufacturing facility that is capable of making one stove per minute. In this factory, first all stove components are fabricated from raw materials. Four sub-assembly lines then combine components into different sections (stove top, base, combustion chamber and outer cladding). The final assembly line combines these four sections together, and fits the insulation around the combustion chamber.

With the assembly line and factory build out complete in early 2014, BURN had to renew their focus on sales to achieve milestones set out by their investors. Their general manager Eoin Flynn moved his focus from the factory to creating successful partnerships with distributors and financial institutions to make their product both affordable and accessible. By mid-2015, BURN had a demand for 6,000 stoves per month with one sale every five minutes and the continuous flow manufacturing facility, but they still hope to expand their customer demand to meet manufacturing capacity.

Lessons Learned in Manufacturing

Burn learned several lessons through the Spark Fund and through expanding their business. Setting up a manufacturing plant in Kenya comes with its own unique set of challenges. The GM, Eoin Flinn, had experience setting up and managing factories in China and other areas. In other regions such as China, there is large government support for manufacturing plants and a deep pool of candidates to draw from in terms of staff who are experts in manufacturing. These markets also benefit from a broad supply chain and availability of all the resources such as cheap electricity, roads, and other logistics that a company requires for successful manufacturing and dissemination of products.

Eoin explained that, “manufacturing in Africa is cheaper...but harder.” He elaborated that roads are difficult to traverse, building the structure of a factory was harder to do than many other countries, and funds are needed for upfront investment. However, resources were cheaper, and once the initial investment barrier was overcome, manufacturing became much cheaper to do.



Flinn explained that Burn would have had to buy some equipment every quarter, slowing down production and distribution of the product. With the Spark Fund Grant, however, Flinn emphasized that, “A large injection of cash helped us buy all of our equipment” to ramp up production and disseminate at a mass scale. This support allowed Burn to develop their new facilities with ample space to produce a large inventory and to create over 100 jobs in Kenya as well.

Set up costs will be higher than expected when setting up a modernized manufacturing facility. Burn admits that they under budgeted when they began setting up their factory on the outskirts of Nairobi. They chose a location with amenable terms from the land owner and in an area set aside by the Kenyan government to be a manufacturing hub. However, their factory did not have electricity or power connected to the main grid, so they had to spend over \$15,000 US on copper cabling to gain access. There were other unexpected expenses with unreliable or inexperienced contractors responsible for the factory build out. Having access to contingency funding is important when setting up a facility in an emerging or frontier market.

Be sure to invest time and money in setting up a proper human resources department and in training staff. Another lesson learned for Burn was around the importance of a strong human resources department. In manufacturing, there is a tendency to want to bring in more people with the idea that

more bodies will mean more products that can be manufactured and delivered efficiently. However, Flinn reflected on how that was not the case – it was very important for Burn to carefully pick their manufacturing team so that not only were stoves developed and disseminated, but also each and every stove was of the highest quality and was a product Burn could be proud of. The management team focused on finding production leads with manufacturing experience and training them to become middle managers. They also had to focus much of their attention on the quality control checks. To achieve high standards, incentive payments to assembly line teams are based not just on quantity of production, but also on quality, safety and tidiness.

Manufacturing in country allows for quick iteration on product design and response to consumer feedback. Burn originally designed the jikokoa with women in Kenya and tested the product there. However, as they continued to scale operations in the country, they were able to get rapid feedback from customers, noting that adjustments needed to be made to product color, packaging and design in some cases. They are now able to quickly re- design, test iterations with customers, and roll new generations of the jikokoa off of production lines. Over the past two years, they've released at least two iterations of the stove and packaging, reducing costs and increasing consumer uptake.

In depth look: Partnering for Distribution

Burn has had great experiences with several distributors. Historically, Burn has had over 70 distributors, and they continue to expand their database every year. Partly, this is because distributors are somewhat volatile, and the top 3 distributors in one year would not .likely top the list of distributors in the next.

Although there has not been one silver bullet in terms of a distributor, one of the most innovative partnerships has been with [M-Kopa Solar](#). They sell home solar power systems that cover all household lighting and charging needs, even powering radios and televisions. It costs around \$200 US for the system and is targeted toward Kenyans who live off the grid. The consumers are able to pay 40 cents a day for a year to buy the system. If someone does not make their payments, the power system will automatically shut off. This way, payments are usually made on time since power is used as collateral. When they finish the payments for the solar power system, M-Kopa offers them a Jikokoa which they can continue to pay 40 cents a day to buy. The household has already proven that they can keep up with payments, and so far the partnership with M-Kopa has been very successful for both parties.