

Kuniokoa TURBO Pilot Report

June 1, 2020



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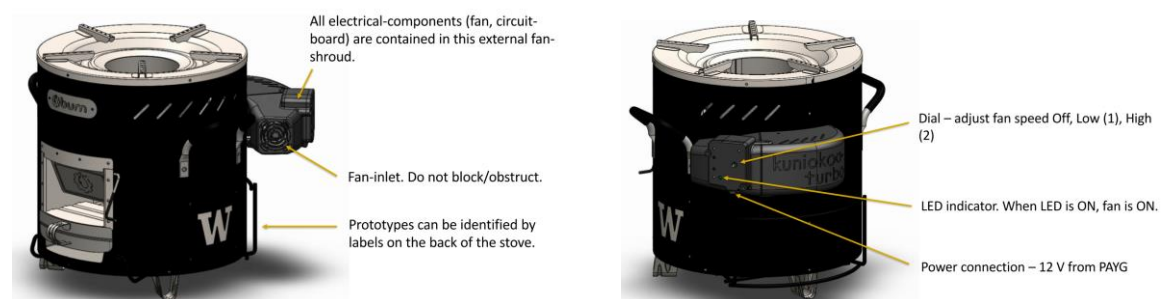
Introduction

In this project, BURN will begin production of the newly designed Kuniokoa TURBO Stove (TURBO) at our factory in Kenya and launch distribution across rural Kenya through existing distribution partnerships. The TURBO is a forced draft biomass stove that is compatible with Pay-As-You-Go ("PAYG") solar systems and is more efficient and cleaner-burning than our innovative original Kuniokoa stove (Kuniokoa).

The study was conducted on several iterations of the stoves since August 2018.

- Briquettes are viewed by BURN as a sustainable form of biomass that is more easily rolled-out across SSA. We see this as the future of clean cooking on the continent in the next decade as LPG is often stacked and viewed as a "status appliance" that is typically underutilized.
- When burning briquettes extra airflow is required in order to combust efficiently, which also drives the smoke and emissions. A fan is necessary to burn the briquettes and ensure that this airflow occurs.
- This overview covers several iterations of stove design including die-tube (ST) and riser-forced-draft (RFD).
- The participants were peri-urban or rural and split across access to solar and grid connections.
- We have had 6 different designs rolled out across 4 deployments. We have about 20 users with home placements. We have also conducted focus groups where additional users gave their feedback and insights.

During the last 12 months, BURN has carried out 4 pilot programs and focus groups for the TURBO. For its most recent pilot which began in October 2019, BURN collected data specifically related to the consumer's willingness to pay (WTP) as well as the consumer's general perception of the stove's usability and durability. WTP is a vital data point in determining the correct price point for launching the TURBO.



Participants

The target market for this pilot of the TURBO were consumers whose primary source of fuel is firewood. The participants selected use firewood daily. Customer feedback informed us that firewood is obtained through a mix of collecting and purchasing.

The targeted participants were primarily connected to the national grid system for an average of 4-6 hours/ a day. This connection is used for lighting bulbs, using the TV, radio, and phone charging. Most of these appliances were bought on a cash basis. The power connection was generally reported to be stable.

Those customers not connected to the national grid reported having a Solar Home System (SHS) mounted to the living room wall. Like the grid users, the system is used to connect TVs, radios, and phone chargers. The majority of these products were purchased with cash. The majority reported to running their system on low power 2-3x/week.

Durability

During our pilot, durability and maintenance of the electrical parts of the Kuniokoa Turbo was seen as the greatest foreseen challenges. Over the 12-month study period, the TURBO has had zero failures in the grate, cooking surface and non-electric parts. One unit had a problem with soot deposition on the programmable circuit board (PCB) which was quickly and easily fixed.

Willingness to pay

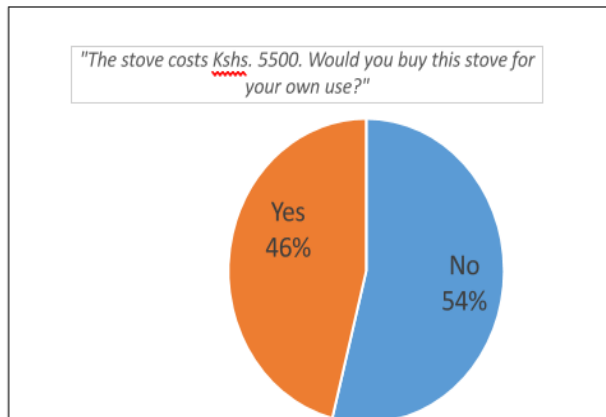
The initial price point of the TURBO was set at KES 5,500. Participants were generally excited by the TURBO and expressed an interest in owning one.

Positive feedback received:

- The speed of cooking, and;
- The cost effectiveness of the stove.

Negative feedback received:

- TURBO price was viewed as high and could be a barrier to purchase;
- Most respondents felt that the Kuniokoa stove was not only less expensive but also easier to use and maintain than the TURBO.



INTEREST IN PURCHASE- "The stove costs Kshs. 5500, would you buy this stove for your own use?"	
	%
Lights fast	38%
Cooks fast	66%
Attractive	28%
Economical	62%
Fan helps in regulating heat output	3%
Can cook for many people	3%
Firm handles	7%
Firm feet	3%
Portable	21%
Easy to use	10%
The tunnel speeds up cooking	3%
Easy disposal of ash	10%
Emits less smoke	3%
Has a fan	3%
Saves time	3%
Simple to use	3%
The fan speeds up cooking	7%
Total	100%



Usability

Research was carried out to establish / validate the usability and durability of the TURBO.

For this pilot, the Kuniokoa was used as a baseline for comparison purposes. The participants were also familiar with the Ecozoom Dura, the Envirofit Tosha and the Biolite stoves and made comparisons between these stoves and the TURBO.

Approximately half of the participants regularly use wet firewood and the half used dry firewood. There was no feedback that the TURBO stoves performed better than the Kuniokoa when using wet firewood. Similarly, the research team also observed that the baseline stove and the TURBO stove both performed similarly when burning wet wood.

Data was collected on a pre-cooking and post-cooking basis. Prior to cooking, the participants generally chose the Kuniokoa because they viewed it as simple to operate. Other comments were based on shared features of the stoves; swing shelf, ash tray, portability, durability and aesthetics.

Feedback received prior to cooking included:

1. The swing shelves and air tray could easily break because of the frequency of folding and unfolding and direct exposure to heat;
2. Pot supports were seen to be unlikely to withstand the weight of heavy pots over time;
3. The tunnel on the tunnel stove was seen to be the first to break because of the material
4. The participants generally thought that the purpose of the tunnel was to retain heat. During cooking they observed that the tunnel prevented excess air from getting into the stove, hence controlling the heat output and retained heat reducing fuel consumption. Most participants did not have any issues with this, however, some felt that it limited the space for feeding firewood.

Feedback from participants after cooking included:

1. Participants generally liked that the fan helped reduce their cooking time and that it was easier to control heat.
2. Some participants found that the fan still has a lot of heat even at low power.

3. The majority of the participants appreciated that all the stoves, including the baseline stove, the Kuniokoa, cooked fast and used less firewood.
4. All stoves with a fan were seen to easily control heat.
5. Participants also pointed out that the tunnel helped retain heat in the stove.
6. Participants mentioned that the swing door on the stoves that had a swing door hindered easy movement of firewood.
7. The lack of an ashtray on the Airtray stove was seen as a negative.

After use, the Kuniokoa was voted least favourite stove due to the slightly slower cooking rate compared to the other stoves. The Kuniokoa also scored the lowest in terms of ease of use and tending rate. The tunnel was disliked because it seemed to limit the amount of firewood that can be fed into the stove door.

Prior to cooking, the Airtray did not rank highly. After use, the Airtray stove was highly favoured because it cooked the fastest. This was attributed to the fact that it did not have a swing door which meant that it allowed more air to come in. Similarly, the participants felt that it was easier to slide firewood into the stove without the presence of the swing door.

“What do you like about each stove?”
For those who interacted with RFD

Kuniokoa	%
Cooking speed	32%
Lights fast	17%
Economical	12%
No smoke	7%
Presence of wood shelf	5%
Less tending	5%
Nothing	5%
Firm deck	5%
Presence of ash tray	2%
Retains heat	2%
SB does not get hot	2%
Swing door	2%
No soot	2%
Total	100%

Biolite	%
Cooking speed	21%
Retains heat	16%
Economical	14%
No soot	12%
Less tending	7%
Nothing	7%
No smoke	7%
Stable	5%
Charging capabilities	2%
Durable SB material	2%
SB does not get hot	2%
Lights fast	2%
Presence of wood shelf	2%
Total	100%

Turbo RFD	%
Cooking speed	24%
Presence of variable fan	24%
Lights fast	14%
Presence of fan	10%
Economical	10%
No smoke	8%
No soot	4%
Less tending	4%
Even distribution of heat	2%
SB does not get hot	2%
Total	100%

**“What difficulty did you experience when using each of the stove?
For those who interacted with RFD**

<u>Kuniokoa</u>	%
None	32%
Hard to light	21%
Smokey	14%
Sooty	11%
High tending rate	7%
Unstable PS	7%
No fan	7%
Total	100%

<u>Biolite</u>	%
Hard to light	47%
Smokey	19%
None	8%
No ash tray	6%
Unstable PS	6%
Primary door is too open	3%
High tending rate	3%
Lack of a grate	3%
Small deck size	3%
No feet	3%
Total	100%

<u>Turbo RFD</u>	%
None	64%
Hard to light	23%
Unstable PS	5%
Not economical	5%
Smokey	5%
Total	100%

User perception - Competition

- BURN focus group results: After cooking and before price reveal, Kuniokoa Turbo was selected by 85% of participants as their favorite.
- After cooking and price reveal:



	<u>Kuniokoa Turbo</u>	<u>Ecozoom Dura</u>	<u>Kuniokoa</u>	<u>Envirofit Tosha</u>	<u>Biolite</u>
After cooking and price reveal	53%	37%	5%	5%	0%

Conclusions

Prior to cooking, it was apparent that the brand recognition that BURN recognizes in the target market is substantial. The Kuniokoa was generally chosen as the stove of choice based on BURN’s reputation and the participants’ previous exposure to BURN’s stoves.

Participants viewed cost effectiveness and value for money as high priorities. Although the initial price of the TURBO was considered high by some participants, most viewed it as value for money over the long term.

From the data collected, we saw that the primary barrier to uptake of the TURBO is unfamiliarity with the benefits of the addition of the fan. Participants generally changed their view on which stove was favoured following use. After use, the TURBO was generally viewed by participants as a superior stove.



Photographs showing our predominantly female workforce in the factory manufacturing the TURBO





Photographs showing customers using the TURBO during Pilots and Focus Groups