



Moving Forward on Clean Cooking Standards: Updates from Malawi and Ethiopia

Webinar Q&A

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Can you please clarify the terminology clean cookstoves vs. clean cooking solutions?

Ethiopia: Clean cookstove refers to the stove while cooking solution goes beyond just the technology. It covers the fuel, stove, availability, acceptability, management, etc.

In Malawi, we use the term CLEANER (Convenient (fast, appropriate); Less smoke; Efficient on fuel use; Affordable and available (accessible); Not harmful (safe) Easy to use and aesthetic (buy beautiful, cook easy); Robust (durable, strong and long lasting) as opposed to clean because we recognize that it is not a stove or fuel that is "clean". Rather, it is how the fuel is prepared and how a stove is operated. For example, for wood stoves, a CLEANER solution would mean that a stove is being operated in a way to achieve a clean combustion, especially if the fuel is dry.

Can wood stoves really be clean? If so, what tier levels have been reported for the stoves?

Ethiopia: It depends upon the design of the stove, stoves such as forced draft biomass stoves are operating with high thermal efficiency and minimal emission can be classified as clean.

Malawi: Wood stoves can be CLEANER (not entirely clean) depending on how the stove is being operated in a way to achieve a clean combustion. Part of the awareness raising on cooking with firewood incorporates messaging on how to dry firewood as opposed to cooking with wet firewood which is more harmful by producing more smoke. Dwindling forests through unsustainable wood use is the biggest concern in Malawi, as opposed to emissions, as most cooking is done outdoors or in well ventilated places. Therefore the National Cookstove Steering Committee (NCSC) Technical Working Group that fed into the draft domesticated standards decided that our priority in Malawi and important criteria for cookstoves are Thermal Efficiency (20% for firewood cookstoves and 30% for charcoal stoves), Safety and Durability. For a stove to be regarded as meeting satisfactory standards, its Thermal

Efficiency score should be anything above 20% (Tier 2 as to the ISO VPT Voluntary Performance Targets) and its Safety score should at least be 68% or above (Tier 2 as to the ISO VPT).

Are you including ethanol stoves in your testing and development efforts?

Ethiopia: Yes.

Malawi: The NCSC has recently begun to have the ethanol for cooking conversation with 2 stakeholders in the committee looking to promote ethanol stoves. It is still in the early stages because in Malawi, ethanol production is very seasonal and mostly used for petrol blending and human consumption (locally brewed kachasu). That makes it not so competitive as a cooking fuel since ethanol prices are pegged to the petroleum import prices, thus not competitive compared to LPG on cost-benefit. The NCSC ethanol members are looking to develop prototypes of ethanol stoves so that local communities can use their ethanol produced in rural areas with subsidized stoves as it is done in Ethiopia.

Do you have standard on wood as fuel?

For the case of Ethiopia, we don't.

No, Malawi does not have standards on wood as fuel because it would not make sense to do so. Wood is a naturally occurring substance and it will always depend on how it is cut, dried and fed into a fire or stove. Wood that is wet and wood that is dry will have very different emission rates. We do have standards for processed fuels such as charcoal, charcoal briquettes and coal briquettes, because in those cases, you can look at the way the original input material has been refined and examine factors such as moisture level, ash content, etc. For wood-related standards, we have standards on cookstoves, including wood cookstoves.

Could you explain Malawi and Ethiopia's take on preparedness in terms of supporting the producers on cutting the costs of establishing testing centers and Business Development Services? Testing must be embraced as a business culture aimed at placing the best quality product on the market.

Ethiopia: It depends on the situation, there are some activities to enhance the stove labeling programme that the Government is interested to cover the cost of stove testing (for certain number of stoves) to encourage producers to voluntarily participate in the labelling program.

Malawi is trying to limit the standards requirements to parameters that can be tested within country and that even a stove producer can test for (fuel consumption, safety) during product development before sending a prototype to a recognized testing facility.

Have you seen a correlation between the development and roll out of these standards and higher adoption of improved cookstoves by the public?

Ethiopia: It is too early to comment on the impacts of standard on the adoption of improved cookstove.

Malawi's standards **will be voluntary** when they are finally rolled out. At the present moment, they are still draft versions waiting approval by the MBS Board so it is still too early to tell with regard to adoption by the public.

Do you track usage of different types of stoves and fuels sold?

Ethiopia: Usage tracking is a difficult task that requires huge investment. However through impact assessment it has been tried to get some information on usage rate of stoves in randomly selected households and the result was encouraging.

Malawi: Some companies and organisations track usage of their stoves and fuels depending on their program and funding requirements or company structure setups. They do this for different purposes. LPG distributors track usage so that they can compare with usage of charcoal and determine their early adopters/market. Other organisations/companies track their usage to determine adoption of their stoves or fuels in their target areas and determine whether to conduct more awareness raising or introduce more varieties or source more funding. It varies based on who and why?

Questions to Malawi:

How long do the chitetezo stoves last? 2 million stoves is over what time period? What is the price for these stoves (USD equivalent)?

Currently, the Chitetezo Mbaula is documented to last on average 47 months (as per a survey of a carbon credit programme document published by HESTIAN). EnDev actually counts stoves on a semesterly basis, incorporating only stoves that have been distributed not more than 2 years prior and takes a conservative estimate of 2 years lifespan. However, there are plans to conduct new surveys to determine the lifespan of Chitetezo Mbaula that have been distributed over the years as we do know that there are some stoves that have lasted even 5-8 years.

The 2 million stoves count is from the year 2013, when the Malawi president declared the goal of 2 million improved stoves to be reached until the end of 2020. We have currently surpassed this goal by a little over 40,000 and are in the process of verifying and updating the online database.

The Chitetezo Mbaula costs MWK1,500 retail price which is equivalent to USD2. Wholesale at the production site can be nearly half of that.

How can I get information on your database? Is it public? [Related: How can we find the map you mentioned?]

The website for the database is https://energypedia.info/wiki/Malawi_Cookstove_DB

I understand that the priorities in Malawi were efficiency, safety and durability. Are emissions of PM and CO included in the standards?

Emissions are included in the standards. However, as Malawi is unable to test them (we do not have the required equipment in our labs), we have resolved to importing stoves that come with certified test data from accredited labs for emissions rates that are acceptable according to our standards. The priorities that Malawi has set therefore, are used for our testing protocols (which we have adapted from the ISO and domesticated to define our own tier levels). We also advocate for cooking practices that reduce harmful emissions, such as drying firewood adequately, cooking outdoors in **clean** ODF Zone areas (Open Defecation Free zone) when possible to dilute stove emissions and building well ventilated

kitchens if cooking occurs indoors, especially in the rainy season. Ventilated kitchen designs are part of the government's ODF Zone guidelines. There are 9 districts to date that have been declared ODF Zones adhering to these guidelines which are health-related, discouraging cooking outdoors to prevent winds transporting harmful debris into food unless ODF.

What was needed to "domesticate" the standards? What departure/complement/adjustments from ISO were needed?

This process involved take-aways from the general NCSC membership, the NCSC Technical Working Group defining the benchmarks of our tier levels and taking part in the Malawi Bureau of Standards' (MBS) National Technical Committee (NTC) meeting where final draft Malawi Standards on adaptation/adoption/domestication of ISO19867-1 was discussed. To do this, we looked at Draft Malawi Standards DMS 1512-1: 2019, DMS 1512-3: 2019 and DMS 1513: 2019:

- Standard test sequence for emissions and performance, safety and durability
- Voluntary performance targets for cookstoves based on laboratory testing
- Clean cookstoves and clean cooking solutions —Vocabulary

The MBS NTC was a wide stakeholder group from all sorts of sectors related to cooking. Health, gender, civil society, academia, donors, scientists, manufacturers/producers of technologies, the NCSC, etc. The draft standards documents, upon agreement, were then submitted to the MBS Board for consideration. These standards will initially be voluntary once approved.

In many cases, Energy Ministries don't consider a cookstove to be an "energy" matter - it is only a device which transfers energy from fuel to a cooking vessel. How does the Malawi Energy Ministry manage to prioritize this?

The Malawi Ministry of Energy, through one of its Departments (the Department of Energy Affairs) is actually the Chair of the National Cookstove Steering Committee (NCSC), which was established in 2013 after the Malawi President had declared that Malawi would contribute 2 million cleaner cookstoves towards the commitment of the Clean Cooking Alliance. The NCSC was created to establish a roadmap how to achieve the ambitious goal and to monitor progress towards the goal. This homegrown multi-stakeholder platform has since amalgamated the cooking energy sector and brought together a multitude of stakeholders, putting the cookstove-topic high up on the political agenda. The NCSC's main mandate is to catalyse the adoption of CLEANER cookstoves in the country, most recently achieving (and surpassing) the goal of 2 million cookstoves adopted by the end of 2020. The DoEA conducts its work in the NCSC with support from various stakeholders (e.g.: EnDev, United Purpose, MCHF, the MBAULA Network, CISON ECC, etc). The support offered guides the Department on what the priorities of the country are, how to ensure an enabling environment for the private sector and the market to thrive, how to communicate and raise awareness, what are the technical aspects to consider when spearheading these initiatives, and so on. One of the MoE's most recent victories was the lobbying by the NCSC, through the DoEA, of VAT removal on LPG, wood stoves and LPG cylinders last year which was finally approved by the Ministry of Finance.

If Malawi intends to have stoves tested at outside labs, how will the appropriateness of the fuel used and representativeness of the cooking sequence be assured?

Malawi as a country does not intend to have stoves tested at outside labs. The only outside test results that will be accepted in Malawi will be for emissions testing for imported stoves as they will be required

to come with certification of test results that meet our emissions standards. Malawi does not have the capacity to test for emissions right now. There are, however, a few donor-funded projects that have sent stoves for testing outside (e.g.: EnDev sent the Chitetezo Mbaula to CREEC in Uganda to be tested using the new ISO protocols, no CCTs have been done outside the country, those are only done within country to ensure representativeness) or intend to send stoves outside to compare results there with the results obtained in-country (e.g.: MCHF intends to send a few stoves outside to be tested and have the same tests also conducted at a testing facility in Malawi for comparison purposes). When EnDev sent the Chitetezo Mbaula to Uganda, it was sent together with instructions on how to feed the stove with firewood, appropriate sizes/quantities of the firewood, etc. The stove also uses agri-residue but the test was requested with firewood use only.

Malawi has a large deposit of Kaolin at Dedza; how useful has it been to the ceramic linings of stoves produced in Malawi?

The Kaolin deposits in Dedza are suitable for high-temperature refractory bricks that get exposed to temperatures above 1,200 °C. The downside is that they also have to be fired at high temperatures, which makes the firing process wood-consuming and expensive. The kaolin was tried for fire-chambers of institutional stoves, but it is an overkill for household-stove ceramic liners. We also found that the red clay is more temperature elastic, much cheaper and found everywhere in the country. Therefore the Chitetezo Mbaula, which is made completely out of clay, not as a lining for the stove, is made from red clay and not kaolinitic white clays. There are also other stoves, eg: KCJ stoves, with ceramic lining that are made nationwide wherever there are clay deposits, including in Dedza, which also has spectacular red clay. There are several Chitetezo Mbaula stove production groups in Dedza, most of which are our best performing groups.

How different are those different stoves you have in Malawi, in terms of emission levels and efficiency? What test methods do you use for testing those stoves?

Malawi has not much different stoves than other countries. The KCJ-type stove is the baseline for charcoal. What makes the Chitetezo Mbaula different from the Kenyan Upesi stoves, from which it was originally inspired is that there has been a lot of the rocket stove principles applied to make the stove as efficient as possible: it is as high and narrow as possible to keep the fire hot but not causing excessive instability of the stove, and the door was made smaller to limit excess cold air entering the fire chamber. The pot-rests are lowered to 15 mm to ensure an optimal heat transfer into the bottom of the pot as the flue gases are forced through the small gap.

How do you carry out testing for fixed stoves?

The manufacturers of the fixed stoves come and build a stove at the testing lab. We have had 4 fixed stoves built/fixed at the lab for testing in the last round of tests conducted by MBS.

Are the stove designs and material used 8 years ago the same as the stoves being disseminated now?

Yes and no. There have been design upgrades over the years for some stoves, eg: Chitetezo Mbaula and our KCJ-type stove, while using the 'same' clay, which of course has a wide variety of properties, depending on the clay source. There have also been new materials (or material sources) introduced to some stoves. Other stoves have not changed at all.

Questions for Ethiopia:

What is your minimum performance standard for biomass stove to be called improved over the baseline stove?

The minimum requirement for biomass stove is as indicated in this table:

Type of stove	Thermal ^a efficiency %	Emissions ^a		Safety ^b	Durability ^a
		CO g/MJd	PM _{2.5} mg/MJ d		
Natural draft solid biomass stove	≥20	≤7.2	≤ 321	≥ 77	< 20
Forced draft solid biomass stove	≥30	≤4.4	≤218	≥ 77	< 20
Charcoal	>30	< 4.4	<218	≥ 77	< 20

How is the Ministry working advance the design of the stoves in Ethiopia, since the existing design has been around for many years?

Yes, we have been using some of the stoves for many years. However there are a lot of efforts by the government and private sector advancing in the design of stoves (induction Injera baking stoves, gasifier, variety of locally produced electric stove). The government welcomes any innovative cookstove technology that fits Ethiopian cooking habits and is affordable.

Can you explain more about what you mean by acceptability testing?

Acceptability testing is the qualitative assessment of a stove to measure its performance at field level and collect feedback of the stove from the households using it. The assessment reports:

- the applicability and use of the stoves in the specific locality
- the acceptance of the stove related to income and environmental aspects
- the attitude of the beneficiaries towards the use of improved stove against competitive baseline stove with relation to the issues of health, expenditure and socio-cultural aspects
- whether the use of stove will lead to an improvement of social and economic situations of the households.