

Transforming the Cookstoves Market in Uganda

29 March 2016

Executive Summary

The private sector and the government of Uganda seek to transition households to cleaner and more efficient stoves and fuels to improve health and reduce environmental impacts, in part through the application of best practice principles from standards and labeling (S&L) programs, including:

- Establishing performance criteria to set a benchmark for manufacturers to meet;
- Testing products to better understand their performance and improve confidence; and
- Conveying information to increase awareness of the benefits of clean and efficient cookstoves.

The specific S&L components, such as scope, metrics, and label types, that will be most beneficial to the market are based on the policy environment, market actors, technology landscape, and consumers.

Based on assessments of the Ugandan market, experiences from Ugandan standards for appliances, and input from Ugandan stakeholders in September 2015, here are seven key recommendations that will create immediate impacts or provide important foundations for long-term program success:

1. Begin the UNACC labeling program **using efficiency as a product performance criterion**, and **include emissions in product testing and reporting**.
2. **Start with a voluntary S&L program** and evaluate the feasibility of transitioning to a mandatory one.
3. **Increase stakeholder engagement** in standards development, both for the voluntary UNACC standards and the upcoming UNBS standards, to ensure that resulting policies reflect the diversity of interests, are realistic, and are based in stakeholder consensus. Communicating the value of standards and labeling is a critical first step in achieving this.
4. **Incorporate the most recent international best practices**, including application of the international standard into the national standard and use of performance-based language.
5. **Award technological innovation** to promote the development of a variety of cookstove technologies.
6. **Develop a certification plan for domestic and international testing facilities** so that they can accurately evaluate and convey product performance to UNACC and the government of Uganda.
7. **Create a compliance plan**, and define and communicate mandates for compliance in consultation with stakeholders to maintain consumer, manufacturer, and investor trust in the S&L program. The plan should include product certification based on accredited third party testing, screen testing to survey the market, and an enforcement strategy outlining timely and appropriate actions.

A voluntary, private sector label for improved cookstoves will provide a good starting point for cookstoves S&L in Uganda. A national government-run program can then build on the lessons and successes of that program. As a whole, Uganda's leadership in S&L will provide useful lessons to other countries in the region and worldwide.

Introduction

More than ninety percent of the total energy used in Uganda comes from biomass fuel, exposing Ugandans to harmful pollutants emitted by burning wood or charcoal. Over 4.5 million households – more than half – are exposed to harmful gases including carbon monoxide from use of open fires or charcoal stoves in kitchens. Acute respiratory infections, which are linked to this indoor air pollution, are responsible for over 8% of infant deaths.¹ In Uganda and around the world, the market for clean and efficient cookstoves and fuels is nascent. Many national and international initiatives are already underway to make better cookstoves and fuels available to Ugandans, including private manufacturer initiatives through profit-based business models, non-governmental initiatives, and ongoing government initiatives. Most of these programs focus on the charcoal stoves used by some peri-urban and many urban households.

The government of Uganda recognizes dire harm caused by open fires and traditional stoves and is seeking to transition consumers from traditional biomass or charcoal stoves to cleaner, more efficient stoves, and, where possible, from traditional fuels to cleaner fuels like LPG, ethanol, biogas, or pellets.

To facilitate and accelerate this transition and enhance the benefits to the Ugandan people and environment, the government of Uganda can apply best practices from traditional product market transformation efforts, like standards and labeling (S&L) programs, to the cookstoves market. These include:

- **Testing products** to better understand their performance and improve confidence among consumers and investors;
- **Establishing performance criteria** for efficiency, emissions, and safety to set a benchmark for manufacturers to meet; and
- **Conveying information** to consumers, distributors, and retailers, through labels and public awareness campaigns, to increase awareness of the benefits of clean and efficient cookstoves.

The mechanisms of standards and labeling can provide a foundation for transforming the market for clean and efficient cookstoves, and create a springboard for other complementary efforts to move consumers to better and better options.

Lessons from other market transformation efforts can be applied to the Ugandan cookstoves market

The long-term development of a market for clean and efficient cookstoves ultimately depends on changing the behavior of consumers, since their purchasing preferences set the priorities for manufacturer decisions. In the early stages of market development, S&L policies and principles – testing, performance evaluation, and information-sharing – can provide a unique set of complementary tools to help consumers make more informed decisions and increase their confidence in these high-performing products.

S&L policies are proven market transformation tools, and have been used to enhance product markets for over 40 years in Ghana, Australia, the EU, the US, India, and many other countries. Product standards

¹ Uganda Market Assessment – Sector Mapping. Global Alliance for Clean Cookstoves, March 2012.

remove lowest-performing products from the market, while labels convey information to consumers to stimulate the purchase of high-performing products. Labels consequently drive innovation and competition among manufacturers by rewarding high-performing products.

In the emerging market for clean and efficient cookstoves, there can be significant variation in the efficiency and emissions of products among different manufacturers or even within a single manufacturer’s product line. These characteristics are shared by many emerging product markets providing modern energy services to under-served communities in the developing world. Nevertheless, in the past five years, the principles of S&L have been applied to early-stage market development efforts with great success. Relevant examples include Lighting Global and Global LEAP.

Applying these S&L principles to cookstoves requires an understanding of attributes that define the cookstoves market as well as the actors leading the existing S&L program in Uganda.

But in several ways, the cookstoves market in Uganda is unique

The cookstoves market in Uganda is unique from the home appliance market in a number of ways, which has implications for designing an appropriate and effective S&L strategy. Based on feedback from Ugandan stakeholders in September 2015, six key attributes of the cookstoves market and their potential implications for S&L are presented in Figure 1 and described below.

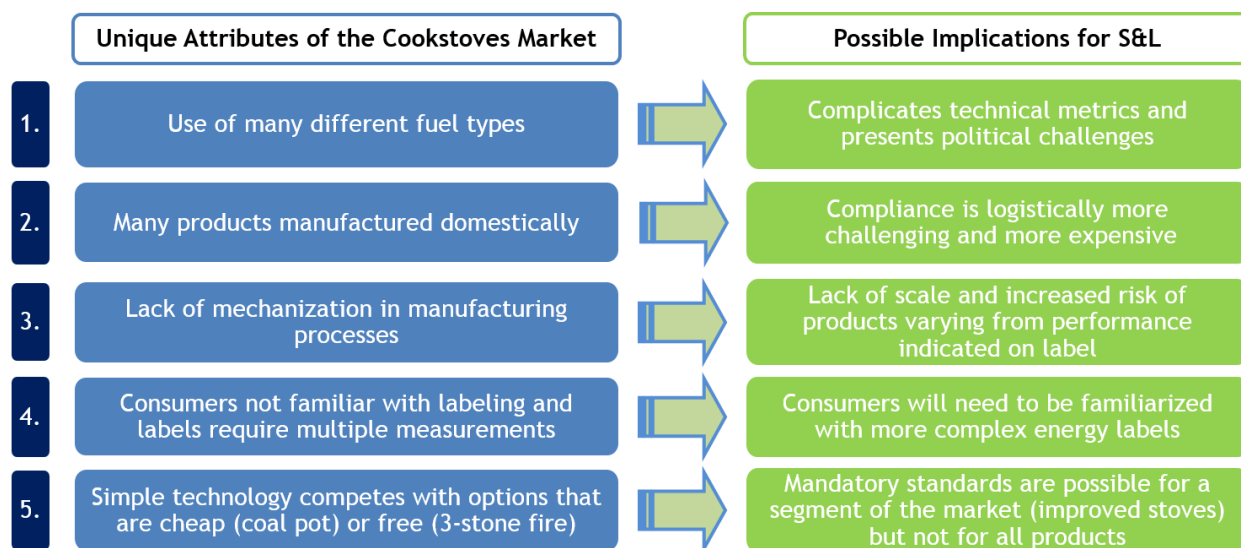


Figure 1: Cookstove market's unique attributes and their possible implications for standards and labeling

1. Whereas most appliances run primarily on one fuel type (electricity or natural gas), **cookstoves use many different fuel types** (including wood, biomass, pellets, charcoal, briquettes, and LPG). This can complicate each phase of S&L – development, implementation, compliance, and evaluation – because both cookstoves and fuels can impact overall efficiency and emissions performance. Therefore the relationship between cookstoves and fuel types must be accounted for throughout the process. In addition, there may be strong support for specific fuel types from stakeholder throughout their supply chains, as well as government agencies or other entities with vested interests.

2. **Domestic manufacturing** makes up a significant portion of the cookstoves and improved cookstoves market in Uganda. Compliance (also known as monitoring, verification, and enforcement, or MV&E) for a domestic manufacturing industry presents challenges unique from industries dependent on imports. For example, without the benefit of ports or other predetermined venues where products enter the market, alternative methods of monitoring products on the market need to be identified and implemented. These methods often require more human and financial resources.
3. There is a **lack of mechanization** in manufacturing processes in Uganda due to limited access to the financial resources necessary to invest in machinery. An S&L program can help reduce barriers to financial resources by providing reliable performance information to potential investors who can then assist manufacturers in overcoming capital cost barriers. These resources can then enable domestic cookstove manufacturers to scale up their operations by investing in necessary machines, processes, and systems.

This scale-up will also drive increased consistency in domestically manufactured improved cookstoves. S&L will drive the market toward standardization by incentivizing manufacturers (through, for example, compliance efforts or opportunities to access capital) to produce more consistent products so as to meet performance and safety specifications.

4. Because energy labels are quite new in Uganda, consumers are **not familiar with product labels**. A lack of consumer understanding or familiarity could lessen a label's positive impacts and potentially undermine product labeling more broadly. They may therefore struggle to interpret cookstove labels, which will require **multiple product characteristics**. It will be important to understand how consumers will prioritize between the multiple characteristics identified on a cookstove performance label.

Two primary measurements should ultimately be included on cookstove labels: *emissions*, which conveys overall health and environmental impacts, and *efficiency*, which conveys fuel savings and environmental impacts. This contrasts with most appliance labels, which often feature a product's energy efficiency as the sole primary metric. Adding to the complexity of the cookstove label, there are also a number of additional important measurements to include on the label including emissions of PM2.5, carbon monoxide, black carbon, safety, and durability.

5. Compared to other appliances, most cookstoves **can be made by hand**, and improved cookstoves often replace a cheap or free alternative. If clean cooking technologies are too expensive, or when cooking some traditional foods, Ugandans will employ the traditional cooking methods of using a low-cost traditional charcoal stove or lighting a fire to meet their cooking needs. As a result, enforcing a mandatory standards program that attempts to prevent the use of traditional cooking technologies is infeasible.

By acting now to begin applying standards and labeling to cookstoves, Uganda is one of the global leaders in this effort. As an innovator in this area, and without the benefit of learning from other countries undertaking similar policies, the above unique attributes of the cookstoves market will likely lead Uganda to face new challenges in the early stages of S&L implementation. Uganda can overcome these challenges through an iterative process that uses ongoing evaluation to revise S&L policies as needed and provide lessons to other countries in the region and worldwide on best practices for cookstoves S&L.

Uganda has some experience developing standards and labeling programs

Uganda has a new standards program for domestic air conditioners, lighting, electric motors, freezers, and refrigerators. The program mandates that all of these products sold within Uganda must meet a minimum energy performance standard. In addition, an energy label is under development. Once it is finalized, products will also be marked with a Uganda energy label.

This program is quite young, but the legal precedent and existing regulatory framework can also support the development of S&L and other market transformation activities for cookstoves and fuels.

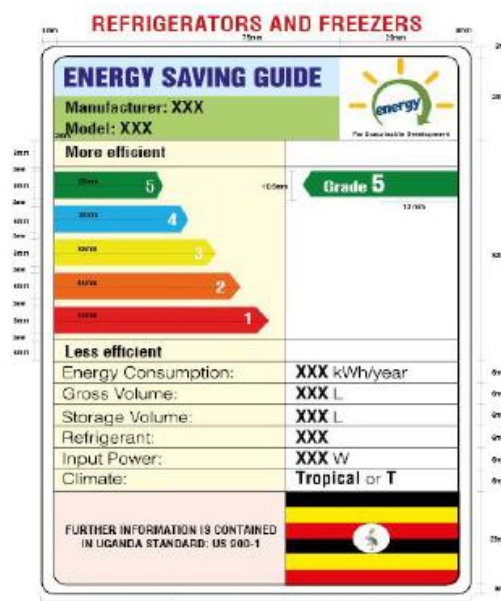


Figure 2: Draft Uganda Energy Label

In addition, there are existing non-governmental labeling programs that aim to identify higher-performing cookstoves available on the market. One such label currently on the market is the “Good stove – Better Cooking” label, which is implemented by GIZ’s EnDev program. To date, there has been little consultation on the requirements for this labeling program. The Uganda National Alliance for Clean Cookstoves (UNACC) is preparing to launch a voluntary labeling program with an endorsement label – or a seal of approval – in the short term. As the Ugandan government continues to develop the national S&L program for cookstoves, this voluntary UNACC program can prepare the market (both manufacturers and consumers) for the later application of national energy performance standards and comparative labels. The UNACC program can also set the basis for various processes that will be required for the implementation of national cookstoves S&L policy, such as implementation processes, compliance, and evaluation.

S&L in Uganda: The National Process

The process for developing and implementing S&L in Uganda for electrical appliances can also be applied for cookstoves – once the system is running smoothly for electrical appliances, the same steps can be led by the same key institutions. The four main phases of the S&L process, as well as the roles of UNBS and other supporting Ugandan institutions, are depicted in Figure 3 and outlined below.

1. UNBS leads the process of **developing the performance standard and test method**, with input and support from the Ministry of Energy and Mineral Development (MEMD) and other stakeholders such as manufacturing associations. UNBS also participates in the development of international standards (for example, through the International Organization for Standardization (ISO)), and updates the national standard to reflect the international standard when appropriate. Future revisions to the performance standard and test method are also the responsibility of UNBS.
2. The next phase is **implementation**, which MEMD’s Energy Efficiency and Conservation Department leads with support from test laboratories. Activities include designing labels; program management and monitoring results; and communication and public education.

3. The third phase, **compliance**, will also be led by MEMD’s Energy Efficiency and Conservation Department following passage of the Energy Efficiency and Conservation Bill which will give the department this authority. This phase will be supported mainly by test laboratories and UNBS. Compliance activities include communication and public education, promoted by all; product performance testing, executed by test labs; and ensuring that imported or sold products comply with requirements. Compliance enforcement measures include administering fines, confiscation and storage of products, custodial sentencing, and/or prosecution.
4. In the fourth phase, **evaluation**, UNBS and MEMD’s Energy Efficiency and Conservation Department review the effectiveness of the existing policies and determine whether to revise the performance standard, test method, or label. If revisions are needed, the process returns to the standard development phase.

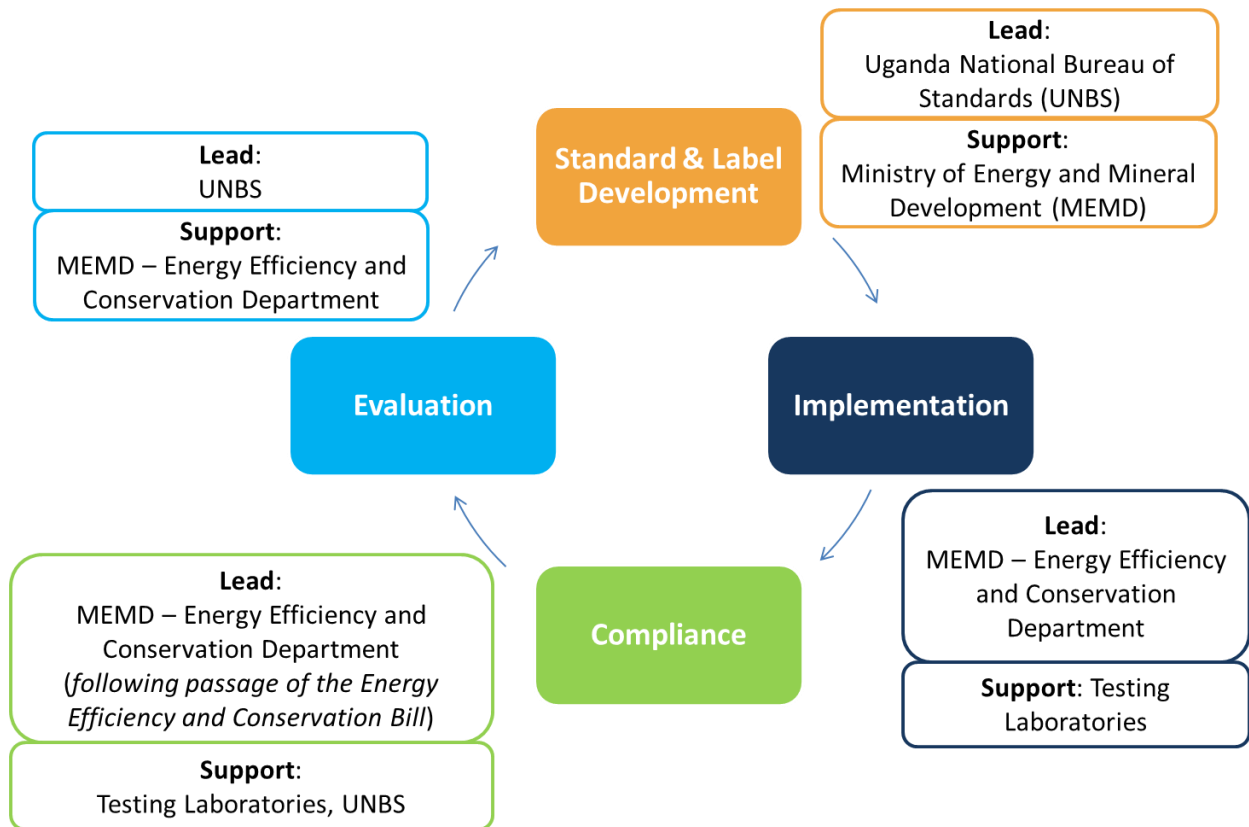


Figure 3: Actors in Uganda's standard and labeling process

S&L in Uganda: The Private Sector Process

UNACC is leading on all aspects for a voluntary sector label, but no clear consensus has been reached on many important aspects of the program including thresholds for efficiency and emissions and label design. The UNACC Standards and Testing Committee leads on standard development. Since members of UNACC and in particular of this Committee include many diverse stakeholders including manufacturers, international organizations and carbon finance organizations, what is adopted by UNACC should be the result of a consensus. This voluntary label can therefore likely serve as a basis for future national S&L policies.

Currently, there has been little development regarding the implementation, compliance and evaluation processes for the voluntary UNACC label. These processes should be defined keeping in mind that this voluntary program can serve as a basis to a national cookstoves S&L policy.

Recommendations based on Market Attributes and Stakeholder Feedback

There are six initial recommendations to overcome these challenges to using S&L principles to move consumers toward cleaner cookstoves. These key recommendations were selected because they can create near-term impacts or are key for program success in the long term, and they require relatively few resources. These recommendations will be expanded in a detailed implementation plan, which will provide in-depth steps for applying the principles of standards and labeling to the cookstoves market in Uganda.

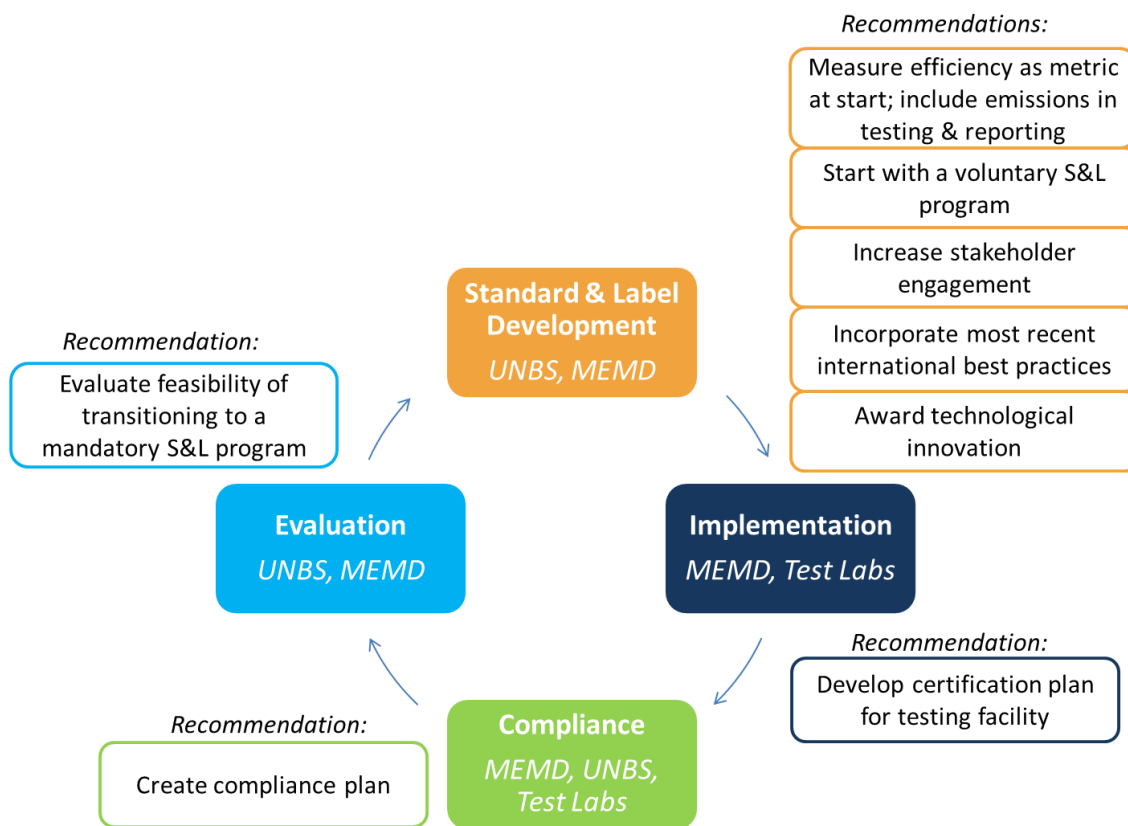


Figure 4: Recommendations for cookstoves standards and labeling process

Begin by using efficiency as performance measure; include emissions in testing & reporting

Recommendation: Begin the UNACC labeling program using efficiency as a product performance criterion, and include emissions in product testing and reporting.

It is important to lay the foundations for an S&L program that takes into account both efficiency and emissions of cookstoves. UNACC should begin its labeling program using efficiency as a product performance criterion. Emissions should still be included in product testing and reporting in order to help improve the emissions test method, and emissions should be introduced as a product performance

criterion in the longer term. UNACC should also plan to, in the future, incorporate updated emissions test methods through the ISO standards process, and testing improvements resulting from round robin testing with many labs around the world.

Start with a voluntary program

Feedback from stakeholders: If clean and efficient cookstoves and fuels are too expensive to cook some traditional foods, Ugandans will employ traditional stoves and fuels. As a result, enforcing a mandatory standard program that attempts to keep traditional cooking technologies off the market is infeasible.

Recommendation: Start with UNACC's private-sector voluntary labeling program for improved cookstoves, followed by UNBS's national government-led voluntary labeling program. After implementation of the voluntary national program, re-evaluate whether to maintain the program as-is or transition to a mandatory scheme.

A voluntary label by UNACC could be established more quickly than a national S&L program and could therefore be used to engage stakeholders, gather more information and prepare the market. The national program would be put in place afterwards, either taking the place of or complementing the UNACC label – depending on respective design of the two programs – and scaling up the effects. The UNACC label should therefore be put in place with the future national program in mind, and UNBS should be kept informed and invited to participate in meetings and provide feedback on UNACC work. Similarly, UNACC should participate in the preparation of a national program through stakeholder meetings and providing feedback based on successes and lessons of the UNACC label.

To determine whether to transition a voluntary national program to a mandatory one, an evaluation process should be conducted on a regular basis (perhaps annually). It should include consideration of the state of the market (i.e., availability and cost of improved stoves) and consideration of resource allocation, because enforcement of a mandatory program may require significant resources. If UNBS chooses to transition from a voluntary label to a mandatory label and standard for improved stoves, it will be important to establish a clear definition for products included as “improved cookstoves” and thus required to meet a certain performance standard.

Increase stakeholder engagement through outreach and workshops

Feedback from stakeholders: There is no clear consensus on several elements of a voluntary UNACC label: for example, the benchmark level of thermal efficiency, whether to include emissions as one of the criteria, or what the label design should look like.

Recommendation: UNACC should hold stakeholder consultations to achieve consensus regarding a voluntary UNACC label. Items for consensus include technical aspects such as defining the efficiency threshold and how to include emissions, and physical aspects such as the label design and standardizing how to apply the label.

It will be important to coordinate the development of this labeling program with major existing programs, such as the EnDev label, to ensure that the programs are complementary. Make sure that all key relevant stakeholders are represented in the consultations. UNBS can participate actively or as an observer in

UNACC stakeholder consultations to understand the thought processes, outputs, and outcomes and to apply these to the establishment of national cookstoves S&L policy. The main steps would be as follows:

- 1) Identify all important features of a voluntary UNACC label. These would include:
 - Product definitions (i.e., scope)
 - Metrics and measurement standards for (1) efficiency, (2) emissions, (3) safety, and (4) durability

In this list of features, identify where consensus has already been reached and which areas will require work to reach consensus within UNACC. Where work is still needed, identify a lead and establish roles, responsibilities and a timeline for the work to progress. Activities across these features would be strongly interrelated and a sequence of tasks and regular updates would need to be planned. A process should also be defined for formal validation by UNACC of each step and decision. This would also provide avenues for informing the national cookstoves S&L policy when it is developed.

- 2) On each of the main themes identified, gather information that will help define recommendations for the UNACC program. This could be done through:
 - Mapping of all existing programs aiming to transform the market for improved cookstoves in Uganda and their criteria for each of the features listed above
 - Gathering market data from Uganda and other relevant economies
 - Discussing with international organizations to make sure that UNACC label criteria meet any necessary criteria to be associated with access to funding or investment
- 3) Define criteria for the UNACC standard that are:
 - Likely to be adopted by international organizations, and
 - Based on evidence of the actual performance of the market.

The UNACC criteria can be considered as a first step to prepare the market for the later UNBS standard, the initial level of which could be more ambitious as a result of this process. All decisions, such as determination of metrics and measurement standards, should be taken with the long-term objective in mind of defining a national S&L program (keeping in mind that measurement methods will continue to evolve, as is the case for all products).

- 4) Meet and receive feedback from international organizations to make sure that the UNACC label criteria are ambitious enough to be associated with access to funding or investment. It should also be understood that the defined levels will be subject to rescaling.

Feedback from stakeholders: There has not been active stakeholder participation in early stages of the UNBS process to develop a standard for cookstoves.

Recommendation: UNACC should encourage stakeholders to participate in the UNBS standards development process. In particular, the leads for each feature mentioned above should be strongly involved in the corresponding discussions taking place for the development of the UNBS standard.

Once UNACC has a clear consensus position on the main features of S&L, UNACC stakeholders may be more inclined to participate in the UNBS process.

Feedback from stakeholders: Many manufacturers do not see the value in doing research to improve product performance, paying for testing or participating in the standards development process. However, input from diverse stakeholders is critical to shaping the most appropriate national policies.

Recommendation: UNACC and UNBS should lay out a clear value proposition for manufacturers about what they will gain in terms of sales from increased consumer awareness, and why that justifies them trying to increase the performance of their products, paying for testing and investing time to participate in standardization.

Standards and labels can most effectively move consumers toward cleaner cookstoves when the development process includes engagement from a diversity of stakeholders. To encourage stakeholder involvement, UNACC and UNBS can convey to each type of stakeholder how a voluntary industry labeling program and a national S&L program will impact them. Participation from a broad array of manufacturers, distributors, test laboratories, government agencies, and development organizations helps to ensure policies:

1. Reflect the diversity of relevant perspectives;
2. Are realistic, rather than being overly restrictive or too lenient;
3. Are based on consensus and support from stakeholders through their participation in the process;
4. Are most appropriate for the national context, easier to implement, and more successful, as a result of the factors above.

Therefore, UNACC and UNBS should consider the following activities to increase engagement from diverse stakeholders:

1. UNACC and BEETA can develop a flyer to describe how S&L programs can help mitigate the risks currently in the cookstoves market and seize the opportunity. It should also make clear how being involved in setting up the program is the best way to ensure that the rules will make sense for their own businesses;
2. UNACC and BEETA can speak with their members to motivate manufacturers to take part in the S&L development process;
3. Use one-on-one outreach to get input from stakeholders;
4. Host stakeholder workshops that:
 - a. Introduce stakeholders to the S&L process and its potential to move consumers toward cleaner cookstoves; and
 - b. Lay out a clear value proposition for manufacturers about the benefits S&L offers them, why they should be actively involved in the process, and why the benefits may justify the costs of testing and participating in the policy development process.

Incorporate most recent international best practices

Feedback from stakeholders: In addition to leading the future process of developing cookstoves S&L in Uganda, UNBS also participates directly on the ISO Technical Committee (TC) 285. UNBS therefore has direct access to the resources being drafted by global technical experts with regards to cookstove standards and testing.

Recommendation: UNBS should incorporate the draft international standard into the national standard – in particular, using the same product definitions and metrics – and use performance-based language (instead of prescriptive language) wherever possible. To the extent possible, these best practices should be incorporated in the voluntary UNACC label.

For example, when testing the safety of a cookstove, the standard should require that the stove be difficult to tip over by leaning it to a particular angle, rather than require a specified number of legs.

All of these recommendations will help ensure that the market is not restricted from innovating toward cleaner technologies that may not be present currently in Uganda. Additionally, this will extend the duration that the standard will remain effective before needing revisions to reflect evolutions in product technology.

Award technological innovation to promote a variety of cookstove technologies

Feedback from stakeholders: Many improved cookstove products on the Uganda market are similar to each other and perform similarly on emissions and efficiency criteria.

Recommendation: Implementation of an awards program should be considered to follow the already-planned MIT D-Lab innovation workshops in August 2016. This will provide a forum for manufacturers to apply concepts from the workshops, and will connect innovation with business opportunities for manufacturers.

An awards program could be run by an objective third party organization with strong involvement and buy-in from Ugandan stakeholders including the Ministry of Energy, UNACC, and development organizations. Products could be judged on two sets of criteria: (1) efficiency and (2) suitability in Uganda. The efficiency criteria would be determined through testing, and the suitability in Uganda would be determined by a panel of judges made up of an array of stakeholders in the sector. The awards program would likely occur in a timeframe of 12-18 months including defining the program terms and conditions, soliciting nominations from manufacturers, evaluating products, and awarding winners. In the absence of resources to provide a financial prize, the award itself could be an endorsement label on winning products.

An awards program recognizing technological innovation would increase the impact of a UNACC voluntary label by increasing the variety of cookstove technologies on the market. This variety of technologies makes standards and labels more effective by enabling manufacturers to differentiate their products and convey to consumers what sets their products apart.

For this reason, it would be useful to implement the awards program before implementing the UNACC label. If implementing the UNACC label on a shorter timeframe is an important priority, then the UNACC label should be revised following the conclusion of the awards program.

Develop certification plan for testing facilities

Feedback from stakeholders: There are currently two main testing facilities for cookstoves, both in Kampala: CREEC and CIRCODU. CREEC specializes in the lab-based testing whereas CIRCODU is the reference for the field-based testing. A third option is CHEMIFA, a laboratory that is used by some international organizations to carry out both the WBT and CCT. UNBS indicated that all laboratories would have to be accredited to participate in the national S&L program. CREEC is currently being assessed for

this potential role. A reliable, accredited testing facility accessible to manufacturers is essential to a successful S&L program.

Recommendation: UNBS should create a plan for certifying domestic and/or international test centers and determine the future role of a potential UNBS test lab. The plan should provide a critical path to certifying one test lab, in order to implement the S&L program without delays

Close consideration should be paid to how many test laboratories the Ugandan market can support. Each of the following items is a critical piece of a certification plan, without which the plan may be ineffective:

- 1) Technical and administrative capacity:
 - a. Assessment of existing technical capacity, and critical path to build test lab capacity to desired levels. Evaluation of administrative capacity according to ISO 17025:2005,² including confidentiality of data, ability to report anonymized test result data to GSA, conflict of interest, etc.
- 2) Financial sustainability:
 - a. Consideration of the number of tests the standard will require in order to evaluate how many accredited labs the market will be able to support.
 - i. More than three tests per product is ideal, especially given the variability of emissions testing data and complexity of the test method.
 - b. Assessment of required financial investment, operating costs, and potential revenue scenarios.
- 3) If multiple test laboratories are necessary:
 - a. Assessment of differences between test laboratories and a process for alignment and coordination between the laboratories.
 - b. Consideration of various possible laboratory roles, such as labs certified for market surveillance and labs that can be used for product declaration and design improvement advisory services.

Create compliance plan

Feedback from stakeholders: A clear and transparent compliance framework will be important for the cookstoves sector in Uganda. While the compliance framework will be finalized later in the process, it can take considerable time to develop and must be done in consultation with stakeholders. A compliance framework is necessary to maintain consumer and manufacturer trust in the S&L program, and that trust leads consumers to purchase cleaner cookstoves and fuels.

Recommendation: UNACC and, later, the national body responsible for compliance should develop a compliance plan for cookstoves. Considerations might include the presence of domestic industry supply chains, how to handle false labels, and monitoring and evaluation of program impacts. More detailed recommendations are below.

After passage of the Energy Efficiency and Conservation Bill, MEMD's Energy Efficiency and Conservation Department should define legal responsibility for the national program and communicate it to

² ISO 17025:2005 -- General requirements for the competence of testing and calibration laboratories; http://www.iso.org/iso/catalogue_detail.htm?csnumber=39883

manufacturers and retailers. A compliance plan should be developed, including consideration of domestic industry supply chains, how to handle false labels, and monitoring and evaluation of program impacts.

Prior to putting in place a compliance framework for the national program, UNACC will have to define their own taking into account what options are realistic given available resources. UNACC should make sure to clearly define responsibilities for compliance.

As part of the compliance plan, consider methods to keep track of sales and market evolution through a product database (which can be begun with product registration). In addition to being a useful tool for compliance, this can facilitate program evaluation for future revisions by providing a source of data to track market developments. There are many examples of product databases available online, with several listed on the [SEAD Initiative website](#) and via the [CLASP website](#).

Effective compliance programs follow a common process, outlined in Figure 5.

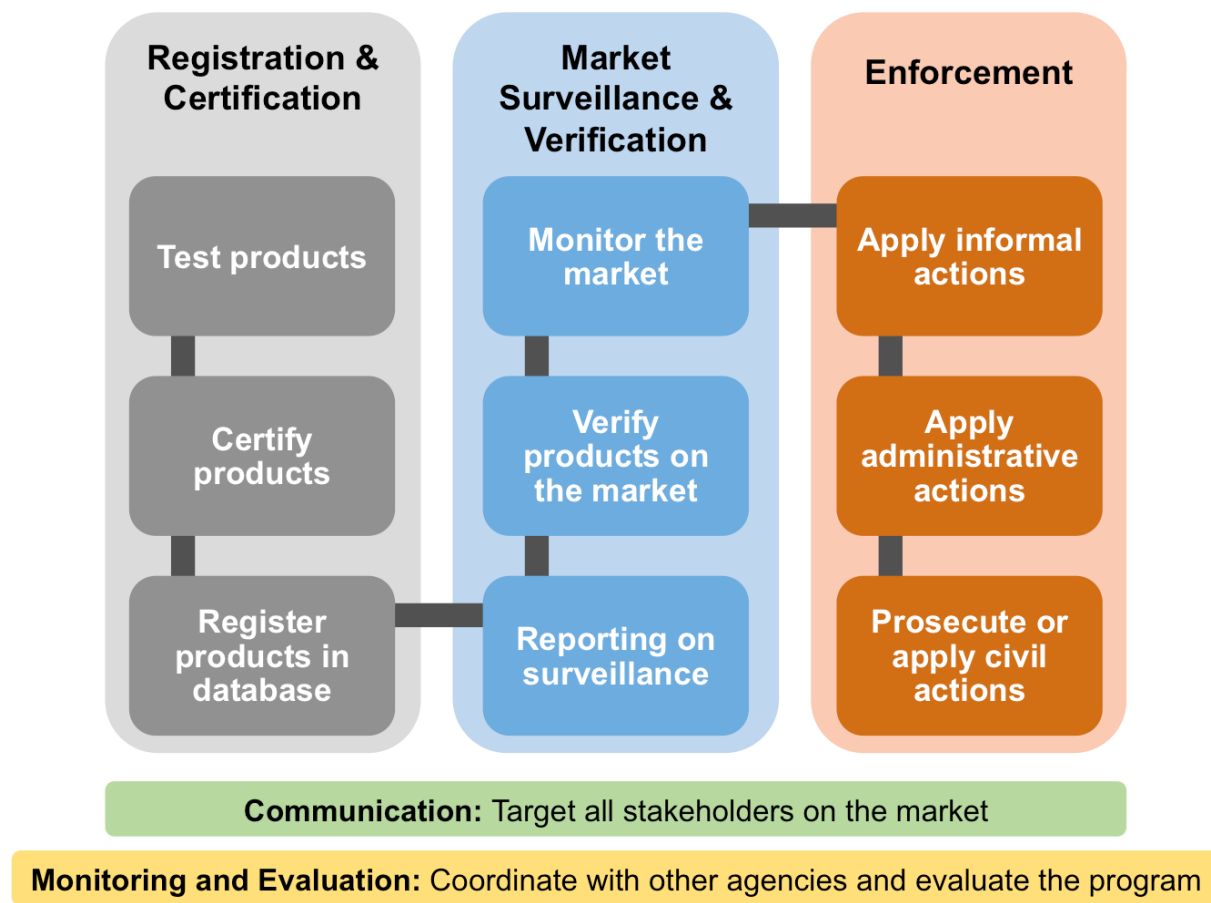


Figure 5: Compliance process flow

Recommendations for Registration & Certification

Recommendation: UNACC and, later, the national body responsible for compliance should administer the certification of products based on product performance, verified by an accredited third party test laboratory.

This option imposes low administration resource requirements on the government, provides a high

degree of accuracy in program evaluation and monitoring, and slightly reduces the need for check testing products once they are on the market. However, this option also imposes a high cost on industry participants who are responsible for the cost of testing.

Recommendations for Market Surveillance & Verification

Recommendation: If products must be tested by an accredited third party test laboratory to enter the Uganda cookstove S&L program, then UNACC and, later, the national body responsible for compliance can perform screening tests in order to provide a reasonable indication of product performance at a lower cost and more quickly than in a full verification test.

Market surveillance strategies must identify and report on even minor incidences of non-compliance, such as not correctly displaying a label. This notifies stakeholders that non-compliance is likely to be detected.

Verification testing determines whether product performance claims have been met by products available on the market. If products must be tested by an accredited third party test laboratory to enter the Uganda cookstove S&L program – as recommended above – then the level of verification activities can be less comprehensive. UNACC and, later, the national body responsible for compliance can perform screening tests in order to provide a reasonable indication of product performance at a lower cost and more quickly than in a full verification test. These tests are typically used to provide a preliminary assessment of which products are most likely to fail a full verification test. Unlike a full verification test, screening tests may use fewer replicate tests or use a laboratory or staff that may not be accredited. If products fail the screening test, a more thorough verification test can be administered to confirm non-compliance.

Recommendations for Enforcement

Recommendation: UNACC and, later, the national body responsible for compliance should develop an enforcement strategy that includes a range of structured, elevating enforcement responses that can be implemented depending on the type of non-compliance and the responsiveness of the non-compliant party.

Enforcement, including remediation, is most effective when action is **timely** and **appropriate**.

When sanctions are necessary, they should be sufficient to outweigh the benefits of non-compliance. To minimize costs and speed up response times, the strategy should include remediation, informal processes, and sanctions requiring low levels of proof. However, it is necessary for the program to have available a credible range of more stringent sanctions in order to raise the perception of risk.

Lastly, communication of the results of non-compliance to manufacturers and other stakeholders is critical. Many of the domestic manufacturers are not familiar with S&L programs or enforcement penalties. The effectiveness of the compliance process to encourage compliance and maintain an effective S&L program is augmented by clear communication with stakeholders.