





Consumer Awareness and Comprehension Market Research of Prospective Cookstoves Labelling Program in Ghana

RESEARCH REPORT





Clasp

KANTAR PUBLIC=

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The label design was contrated to

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GLOBALALLIANCE FOR CLEAN COOKSTOVES

The Global Alliance for Clean Cookstove (Alliance) is a non-governmental organisation established in 2010 by the UN Foundation to promote the adoption of clean cooking solutions. The Alliance, as part of its efforts to facilitate the development and implementation of standards for clean and efficient cookstoves and fuels provided technical support to the Commission to conduct a market research on consumer awareness and the prospects of implementing a labelling scheme for cookstoves in Ghana.

CLASP

CLASP is an international non-profit based in Washington, DC, USA. CLASP's mission is to improve the environmental and energy performance of the appliances and related systems we use every day, lessening their impacts on people and the world around us. CLASP played a key role in the design of this market research work and review of this report. CLASP is working with the Commission to develop a Monitoring, Verification and Enforcement Manual for the proposed cookstove standard and labelling scheme in Ghana.

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Abbreviations and Acronyms

- ATL Above the Line
- BTL Below the Line
- CO Carbon Monoxide
- EC Energy Commission
- FGD Focus Group Discussion
- ID In-depth Interviews
- KII Key Information Interviews
- KPI Key Performance Indicators
- LPG Liquefied Petroleum Gas
- OOH Out of Home
- PM Particulate Matter
- POS Point of Sale
- RTB Reason to Believe
- S&L Standard and Label
- TVC Television Commercial
- WoM Word of Mouth

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Executive Summary

The government of Ghana seeks to transition households to cleaner, safer, and more efficient cookstoves and fuels by developing and implementing a mandatory performance standard and labelling (S&L) for cookstoves (Energy Commission, 2012). In well-designed S&L programmes, standards transform markets by removing low-performing products, while labels empower consumers to make informed choices about the products they buy. Labels are affixed to manufactured products and describe a product's performance (usually in the form of energy usage, efficiency, or emissions) to provide consumers with the information necessary for making informed purchases. Setting and maintaining a high standard of quality is essential for the successful adoption of clean cooking technologies. Stringent enforcement and adherence to standards and labelling mechanisms increases consumer confidence in products and in the long run helps stove producers or manufacturers to increase their productivity and ability to access new markets.

The Energy Commission (EC) of Ghana has partnered with the Global Alliance for Clean Cookstoves (The Alliance) and CLASP in the development and implementation of a national cookstove S&L programme. This study was conducted to collect baseline data on consumer comprehension of the Energy Commission's draft cookstove labels, investigate the effectiveness of various label elements, explore consumer behaviours and attitudes in response to the prospective cookstove labelling programme, and inform the design of the label and communication programme.

The study adopted a qualitative approach to help explore the cognitive behaviours and attitude towards the labels in terms of designs, messages, symbols and how these influence purchase decisions given the context that labelling and communication around labels for cookstoves is relatively new in the Ghanaian market. The summaries of the findings under the thematic areas are clear synthesis of responses from both consumers and institutions recruited for the field work and the information provided reflect majority perspectives on the performance label that was optimised.

Comprehension and likeability of label and features

The concept of mandatory performance label specifically designed for cookstoves although new to majority of cookstove users was seen to be a welcoming and acceptable initiative among Ghanaian consumers. Consumers could relate this concept of mandatory performance label to similar work for the approval of bottle and sachet water production which is very common by the Ghana Standard Authority. Hence, some consumers could clearly differentiate the context and relevance of performance label from product label.

Overall, consumers across targets – household consumers, institutional and commercial users and retailers had strong appeal for the optimised label with strong prominent features such as the cookstove design and the stars. The acceptance and the likeability of the label design are very positive.

The anchor features of the label which include the efficiency levels (represented by stars) and "emissions approved" (inscribed in a hologram-like icon) encapsulates the whole purpose of a performance label which consumers are able to comprehend upon introduction of the concept of improved stove. From the perspective of consumers, the stars represented quality of service, level of patronage, durability, standard ratings and heat regulators which were technically not right in context of what the stars represented on the label. However, a few of the institutional and commercial users associated the stars to the efficiency of the technology. Generally, the concept of emissions from the perspective of consumers had much connection to the combustion level of the cookstove and was interpreted as the ability of the cookstove to burn well

A significant conclusion from the study is that the anchor features (stars and emissions approved icon) were often not associated with the specific performance improvements that were intended by the label. Although, this is perceived to be a knowledge gap and hence low comprehension on the technicalities, consumers across targets do appreciate the concept and existence of improved cookstove brands that delivered their ideal cookstove attributes, including performance, good combustion and its implied benefits. Hence, there is high associated relevance to having improved stove with its efficient and emission approved properties communicated on the label.

Relevance of label and its features

Performance label is perceived to be relevant across all targets. Given that the technology in designing an efficient cookstove is not visible and hard to communicate along with its implied benefits, a performance label can provide trust and confidence to consumers and help them in making purchasing decision for their choice of cookstove. The label itself provides adequate information but less pictorial display for the anchor features which this research sought to strengthen and optimise in the design of the label. Displaying features like efficiency in relation to the number of stars has low comprehension and hence feedback received from the public review process was used to optimise the concept of efficiency in the iteration of the design of the label. Likewise, terminology like emission sounded quite foreign to majority of the household consumers but the pictorial display of the flames cues good combustion and hence good emissions. Generally, the label provides a symbol of identification to decide on the right energy efficient technology and so consumers expressed the need for EC to ensure that the credibility and authenticity of the label is protected to avoid "wrong duplication" of the label in the market.

Understanding of benefits from label design

Prominent benefits which are directly inferred from the label include the cost, fuel and time savings cued from the efficiency of improved cookstove technology. The generic drawing of the stove (cookstove design), originally intended to communicate the product category, was the strongest identifying feature consumers interpreted to emphasize the benefits of the stove, specifically the thickness of the upper part of the stove which consumers associated with heat retention capacity of the stove. This feature although may not be technically universal and acceptable, has proven to be consumers' "reason to believe" on the efficiency of the technology.

Significantly, most household and commercial users of inefficient cooking stoves admit the negative impact on health such as chest and throat related diseases, eye irritation and burns on skins and as such support all initiatives to curb this menace. Hence, the implied health benefits the label seeks to communicate were recounted and confirmed by consumers who are already users of improved stoves.

Also, other benefits such as the environmental benefits were capsulated in the "emissions approved" stamp and depicted with the right coloured flames. Consumers are aware of the pollution that black particulates of smoke release to the environment. Although this was directly linked to health benefits, tranquillity among neighbours living in a compound house type of dwelling¹, customers and people they serve because of less quarrels and displeasure resulting from the spread and inhaling of the smoky fuel release into the environment was equally paramount. Consumers support the fact that good cookstove technology will help reduce the use of fuel including firewood and thereby save our forest in the long term.

Impact on purchasing decisions

Emphatically, performance label is critical for retailers and institutional users as they need that as guarantee at the point of purchase to protect their investment. Also for institutional users, complying with such regulatory requirement will have implied cost savings since it can serve as a form of insurance on the safety of their workers and reduce work related hazards, hence spending less money on fire accidents.

Clearly, the benefits of the technology is acceptable across all categories of users either literate or illiterate but the attitudes towards purchasing of cookstove with a performance label when simulated in this research is slightly different. Given the influx of inferior products into the Ghanaian market, there is little trust on what a label says to consumers and what the product delivers to the consumers. Hence, consumers especially those at the bottom of the pyramid attribute that same mistrust for product label unto performance label. They will therefore require much more evidence or reasons to believe from a product label or communications to guarantee the efficiency of the technology and the benefits implied for an appliance like cookstove. They will want a lot of communications and demonstrations via all platforms of engagement to convince them that the improved technology is believable. Also, purchase will be based on recommendations via word of mouth from relatives and friends. They will require product guarantees on purchases.

Given the fact that the cookstove market is still nascent and most current purchase of appliances is not driven by the energy efficient labels, consumers do not think having a performance label is enough to guarantee purchase especially among the illiterate and low earning group. For example, consumers especially in Northern Ghana who have low income and have access to cheap fuel like firewood or sawdust, anticipate that products with performance labels will have a premium price. This makes them quite reluctant on their propensity to purchase. They will need product level education and recommendation on the product features and functions to equally influence their purchase decisions, and evidence that a label doesn't always mean a higher price.

¹ Compound house refers to a cluster of buildings in an enclosure, having a shared or associated purpose, such as the houses of an extended family. Using a stove that generates much smoke in such dwelling units creates confusion and petty-quarrels among neighbours in such houses.

Recommendations

- 1. The label design should be kept simple, straight forward and have a stepwise approach to introducing much more information as the market matures. It is therefore recommended that the EC keeps the strong anchor features which include the stove design, the inscription for efficiency levels, emissions approved icon and the symbol of the stars.
- 2. The level of comprehension and understanding of label features varied among targets. To increase comprehension levels and the reach of the cookstove labelling programme, the integration of specific target-tailored communication of label features and concepts across the different targets is recommended as follows:
 - Efficiency and emissions were two concepts that had low levels of comprehension and wrong association and misconception across targets. Much emphasis should be placed on these concepts in public education and in the development of communication tools as specified in the communication strategy in Figure 1;
 - Wrong association and misconception of stars on the label to ratings to things such as: likes on social media platforms like Facebook, heat regulators, etc. should be addressed through the development of specific communication tools and rigorous consumer campaigns using all available media platforms;
 - Implement a public campaign strategy that clearly communicates the implied benefits including cost and time savings, health benefits and environmental benefits of an improved and efficient stove.
- 3. Again, given the high illiteracy level of the core users of traditional charcoal or firewood stoves, who are the primary targets for the improved cookstove market, there is a need to embark on the education campaign via multiple channels and use of participatory approaches like community theatres, plays, demonstration to sensitize and raise awareness of the improved technology concept and the implied benefits an improved and efficient stove have on the user's wellbeing and surroundings.
 - Campaign messages should focus on carrying out clear interpretations to components of the label, including efficiency, levels of stars, and emissions approved. Education should directly demonstrate how to consider these label features in the choice of appliance at the point of purchase. Hence, a communication technique which uses teaching approach to enhance association of features to communication rather than a story telling approach so consumers can associate features like rating of stars to efficiency, emissions approved to health benefits, etc., is recommended.
- 4. Also, EC needs to enforce the regulations with manufacturers to ensure consistency and compliance to the specifications on the technology thereby keeping the product delivery consistent to market expectations. This will increase trust and also promote the behaviour and attitudinal change around usage of clean energy appliances broadly.

	Figure 1: C	ommunication Strategy	
		KEY INSIGHT	
	Weak comprehension & appreciation a grasp of informati	and interpretation of features relating to ef ion on the labels and by extension, potent	ficiency & safe emissions limits ial adoption
RK STREAM > >	Stage 1	Stage 2	Stage 3
	EDUCATION	TARGETED MARKETING	MONITORING & EVALUATION
K/OBJECTIVE >>	Raise knowledge of basics of energy efficiency & safe emissions with focus on household & spur interest	Intensify interest, motivations & RTBs to accelerate adoption	Assess progress against KPIs & course correct
TIONS >>	Educational workshops, Usage/Experience panels, Influencer groups (WoM), Functional ATL communication (benefits, contrast) BTL support (OOH)	Extend usage of refined labels, Balance functional vs. functional ATL communication, BTL support, POS/Retail activation, distribution, pricing, product demos	Follow up research to check improvement in comprehension of efficiency & emission vs. target & KPIs
TCOMES >>	Communication briefs, detailed workshop plans, TVC, Radio, OOH, Print executions To lead to improved comprehension & appreciation	Communication briefs & plans, Experiential plans	Follow up research plan
VKEHOLDERS >>	EC Advertising agency – creative & media	Commercial partners / product manufacturers Advertising agency – creative & media	EC Research agency

1. Introduction

1.1 Background

Looking at sub-Saharan Africa, the lack of access to clean stoves and fuels for cooking and heating is especially acute, with a third of the urban population and the vast majority of the rural poor using solid fuels to cook their daily meals over open fires or inefficient stoves made from clay, metal, or bricks². The current rate of solid fuel usage in many countries especially in rural areas is said to be about 80% to 90%.

In Ghana, approximately 20 million people rely primarily on solid fuels for cooking and heating³. Numerous factors position Ghana for success, in the adoption of improved cookstoves, including: an active in-country cookstove market with consumer segments who are ready for but have not yet been reached by improved cookstove initiatives; an entrepreneurial local cookstove production sector; government interest in reducing its citizens' dependency on solid fuels and moving towards cleaner fuels such as liquefied petroleum gas (LPG)⁴ under the UN Sustainable Energy for All (SEforALL) Initiative; and significant interest and support from development partners including the UN Foundation's Global Alliance for Clean Cookstoves and Fuels, German Development Cooperation (GIZ), Netherlands Development Organisation (SNV), and the Global LPG Partnership, among others.

Improved stove technologies vary in quality, performance and reputation. Setting and maintaining a high standard of quality is essential for the successful adoption of clean cooking technologies. Stringent enforcement and adherence to standards and labelling mechanisms increases consumer confidence in products and in the long run help stove producers and manufacturers to increase their productivity and ability to access new markets. The government of Ghana seeks to transition households to cleaner, safer, and more efficient biomass stoves and fuels by developing and implementing performance standard and labelling (S&L) for stoves. In well-designed S&L programmes, standards transform markets by removing low-performing products, while labels empower consumers to make informed choices about the products they buy. Performance labels are affixed to manufactured products and describe a product's performance (usually in the form of energy usage, efficiency, or emissions) to provide consumers with the information necessary for making informed purchases.

³ Ghana Statistical Service, 2014. Ghana Living Standard Survey Round 6, Main Report

² http://cleancookstoves.org/country-profiles/

⁴ https://cleancookstoves.org/binary-data/RESOURCE/file/000/000/334-1.pdf

The Energy Commission has partnered with the Global Alliance for Clean Cookstoves (The Alliance) and CLASP in the development and implementation of a national cookstoves S&L programme.

1.2 Study objectives

The study hinged on two major objectives which are depicted in the diagram below. The ultimate end-product was to use the findings of the research to help Energy Commission (EC) and partners to better refine the draft cookstove label into a simpler and consumer-friendly cookstove label for the Ghanaian market and inform the design of the labelling programme.



2. Methodology

2.1 Research approach

To achieve the objectives of the study, a qualitative approach was used to help deep dive into the cognitive behaviours and attitude towards the labels given the context that labelling and communication around labels for cookstoves is relatively new and immature in the Ghanaian market. This approach helped to explore more about the reactions to the designs, messages and symbols, and how these influence purchase decisions. Further, this approach made it possible to optimise the design through multiple testing across various relevant target groups i.e. consumers, retailers and institutions (senior high schools, government hospitals and local restaurants). The objectives of the study required more of an explorative and formative approach. Hence, the use of cognitive technique which stems up strongly in Behavioural Change and Communication for Development concepts to understand reactions, behaviours and attitudes towards the labels to inform communication.

Given the extensive and informative research done by the Global Alliance for Clean Cookstoves⁵, the primary and secondary targets defined in the cookstove Consumer Segmentation Study was found very useful and used in defining the target groups for the research. The research therefore targeted potential customers that would be early adopters in homes, commercial ventures and public institutions, as well as retailers of cookstoves.

2.1.1 Methods

Qualitative research method - Focus group discussions & in-depth interviews

Focus groups and in-depth interviews are usually useful at the outset of label design efforts to gather broad feedback on the range of labels under consideration. The goal of a Focus Group Discussion (FGD) is to rank each initial label design and to establish which elements of each label are likely to be successful and the reasons thereof. Also, different categories of information were assessed to understand – aesthetics/liking, understanding, simplicity and influence of the labels. The focus groups were used to look at all these dimensions, and not just a single ranking of the label design.

The design for the qualitative was the sequential focus groups to test the draft labels and refine the design. Also, a qualitative face-to-face in-depth interview using Key Informant Interviews (KIIs) with industrial or commercial users (specifically matrons or cooks in public Senior High Schools and hospitals, and local restaurants or 'chop bars') and retailers of cookstoves in all the target regions was adopted to seek their understanding and interpretation of the draft

⁵ Ghana Consumer Segmentation Study 2014-Prepared for: The Global Alliance for Clean Cookstoves, April 2014

label. This is because retailers of cookstoves are mostly the educators of consumers during purchasing to make informed choices about the products they buy and matrons or professional caterers contribute to decision making in choice of stove and fuel used in public institutions.

The sequential focus groups were started off in Accra across both primary and secondary targets and were repeated across groups till the labels were optimised. Representatives of the Energy Commission (the Client) and SCANAD (label re-designer) were present in the initial focus group discussions in Accra to listen to the reviews and interpretations given by the sampled group and identify clues on what and how to re-work the labels to better communicate the message intended. The optimised label was then tested across targets in the various regions.

In total, there were 12 focus group discussions and 26 KIIs undertaken in four (4) different regions (Greater Accra, Western, Ashanti and Northern).

Sequential focus groups

The qualitative approach used sequential recycling in iterative mini focus groups. This approach is a strongly validated face-to-face qualitative method for accelerated assessment and evolution of pack design.

Focus group mix and participant composition

- Each focus group composed of small groups of eight (8) cookstove users led through an open discussion by a skilled moderator from Kantar Public;
- Each focus group section lasted for about 60 minutes to ensure productive time and generation of rich discussions;
- Predominately, a homogeneous group of cookstove users (e.g. traditional charcoal users) who are also strangers to each other comprised the focus groups. The homogeneity here levelled the playing field and reduced inhibitions among people who will probably never see each other again. In some few instances, there were heterogeneous group compositions (e.g. charcoal users & LPG users).

The Ghana Consumer Segmentation Study 2014 carried out by the Global Alliance for Clean Cookstoves and Nationwide Mapping of Stakeholders in the Clean Cookstove Value Chain in Ghana⁶, recommended key consumer segments that clean and efficient cooking technology promoters can target. These are⁷:

⁶/₇ https://cleancookstoves.org/binary-data/RESOURCE/file/000/000/311-1.pdf

Ghana Consumer Segmentation Study 2014-Prepared for: The Global Alliance for Clean Cookstoves, April 2014.

- i. Middle Income-High Income Urban Charcoal users: These are the households with the highest potential for clean cookstoves and fuel adoption due to their high purchasing power. According to the study, the Middle Income-High Income Urban Charcoal users constitute 17% of the Ghanaian market of approximately 1.04 million households. With geographical focus, this segment can be found in these strategic target regions: Greater Accra, Western and Central regions;
- ii. Middle Income-High Income Rural Wood users: These users are said to represent a significant opportunity for marketers of clean cooking solutions. They invest in modern home appliances due to their high purchasing power and have additional incentives (such as convenience, cleanliness or speed-of-use), to consider clean and efficient cookstoves. This segment is estimated as 29% of the market or 1.8 million households. Strategic target regions per the study are the Northern, Ashanti and Eastern Regions; and
- iii. High Income Urban LPG & Gyapa-type users: These users helped to assess the motivations which led them to switch to this fuel and the barriers that they are facing. According to the Ghana Statistical Service, only 18.2% of households in Ghana fall within this category, using either LPG or the Gyapa (a locally manufactured improved stove which has a thick ceramic lining for heat retention) type of cookstoves⁸.

In total 12 mini focus groups were carried out across the four (4) regions. See Table 1 for details of the focus group mix.

Consumer segments / Location	High/middle income urban charcoal users	High/middle income rural firewood users	Gyapa-type users & High income urban LPG
Greater	1 x Traditional charcoal users	1 x Traditional firewood users	1 x (Gyapa) users
Accra	1 x Charcoal users & LPG	1 x Charcoal & firewood users	1x (LPG)Users
Ashanti		1 x Traditional firewood users	
		1 x Charcoal & firewood users	
Western	1 x Traditional charcoal users		
	1 x Charcoal users & LPG		
Northern		1 x Traditional firewood users	
		1 x Charcoal & firewood users	
Sub-total FGDs	4	6	2

|--|

⁽Ghana Statistical Service, 2012).

The Accra groups were used to optimise the labels and to test the final labels with consumers in the other regions.

- Once a group of viable recruits had been established, each participant was called to confirm interest and availability. They were given times and locations of the focus groups. Calls to remind participants were done two days before the scheduled group.
- Over-invite in anticipation of a no-show rate of 10 to 20 percent was expected for this project but none of the focus groups exceeded eight (8) participants.

Field statistics

FGD statistics: Statistics from the FGDs (Table 2) showed that proposed FGD quotas were achieved across all targets and regions. In all, the FGDs recorded 96 participants across all regions. In terms of the type of stove used by participants, the statistics shows more coal pot users than any other stove type. This also meant charcoal was the dominant fuel type used by respondents. LPG and Gyapa users were recruited to serve as control group for the study.

Designing focus group questions

There were three types of focus group questions:

- 1. Engagement questions: introduce participants to and make them comfortable with the topic of discussion;
- 2. Exploration questions: (include but not limited to: comprehension, expected benefits, fit-to-product category, purchasing decisions, prioritizing factor of choice);
- 3. Exit question: check to see if anything was missed in the discussion.

Defining targets for the institutional/commercial customers and retailers

The sampling approach for selecting the key informant interviews was very purposive. Given that there are few retailers of improved cookstoves on the market, the client provided a list of the main retailers of improved cookstoves. Out of the list that was provided, eight (8) retailers were selected across the four (4) regions (2 per region) for the KIIs. Also, 3 institutional users were purposively selected across the 4 regions.

The selection was as follows:

- 1. "Chop bar" operators or local restaurants (1 per region)
- 2. Secondary cycle schools (1 per region)
- 3. Government hospitals (1 per region).

Region/City	Type of cookstove consumers recruited use	Number of users recruited	Fuel type
Greater Accra Region (Accra)	Coal pot	16	Charcoal
	Gyapa	8	Charcoal
	Traditional stoves	12	Firewood
	LPG stoves	12	LPG
	Subtotal	48	
Ashanti Region (Kumasi)	Coal pot	4	Charcoal
	Traditional stoves	12	Firewood
	Subtotal	16	
Western Region (Takoradi)	Coal pot	12	Charcoal
	LPG stoves	4	LPG
	Subtotal	16	
Northern Region (Tamale)	Coal pot	4	Charcoal`
	Traditional stoves	12	Firewood
	Subtotal	16	
	Total	96	

Table 2: Distribution of FGD participants

Source: Field Data, March 2017

Statistics on retailers

Out of the eight (8) retailers interviewed, only one had had tertiary level of education with one other also having had Secondary level of education. The other six (6) only had basic level of education. In terms of business size, they all operated small businesses and mostly dealt in mixed cookstove sales, selling different brands of cookstoves with the 'Gyapa' brand appearing to be sold by almost all the retailers (see Table 3).

Region	Level of education (completed)	Size of business	Type of cookstove currently sold	Type of fuel used by cookstove
Greater Accra	Basic school	Small	Gyapa, Car rim stoves, Coal pots	Charcoal, kerosene, firewood
	Secondary school	Small	Gyapa, Tayola, Gas stoves, Gas burners and accessories	Gas, charcoal, firewood, gel
Western	Basic school	Small	Gas cooker, Gyapa cookstove, Obaapa cookstove, Car rims	Gas, charcoal
	Tertiary	Small	Gyapa cookstove	Charcoal
Northern	Basic school	Small	Gas cooker, Gyapa cookstove, Sawdust stove	Charcoal, sawdust, firewood
	Basic school	Small	Gas cooker, Gyapa cookstove, Sawdust stove, Car rims	Charcoal, sawdust, firewood
Ashanti	Basic school	Small	Gyapa, Ahibenso, Gas burners	Charcoal, LPG
	Basic school	Small	Gyapa, Ahibenso	Charcoal, firewood

Table 3: Statistics on Retailers

Source: Field Data, March 2017

Statistics on institutional and commercial users

The institutional and commercial users were predominantly using improved cookstoves and clean fuel. They had at least two different cookstove types using different fuel types to save time and reduce cost (see Table 4).

Region	Type of institution	Level of education (completed)	Size of institution	Type of cookstove being used	Type of fuel used by cookstove
Greater	Senior high	Tertiary	1,200 students served	Gyapa, Gas stove,	Gas, charcoal,
Accra	SCHOOL		each day	Coarpot	IIrewood
	Hospital	Tertiary	10 patients served everyday	Coal pot, Gas stove	Gas, charcoal, firewood, gel
	Local restaurant	Secondary	100 customers each day	Gas stove, Coal pot	Gas, charcoal
Western	Senior high school	Tertiary	800 students served every day	Gyapa, Coal pot, Gas stove	LPG, charcoal
	Hospital	Tertiary	50 patients served every day	Gas and Electric cookers	LPG, electricity
	Local restaurant	Secondary	70 customers a day	Gyapa, Gas stove	LPG, charcoal
Northern	Senior high school	Tertiary	478 students served every day	Car Rim and Clay stoves	Firewood
	Hospital	Tertiary	50 patients served every day	Gas and Electric cookers	LPG, electricity
	Local restaurant	Secondary	80 customers per day	Gyapa, Gas stove	LPG, charcoal
Ashanti	Senior high school	Tertiary	750 students served every day	Gyapa, Gas and Electric cookers	LPG, electricity, charcoal
	Hospital	Tertiary	155 patients served every day	Gyapa, Gas stove	LPG, charcoal
	Local restaurant	Secondary	150 customers per day	Gyapa, Gas stove	LPG, charcoal

Table 4: Statistics on institutional and commercial users

Source: Field Data, March 2017

2.2 The design and optimisation of the labels

The survey adopted the sequential monadic⁹ approach in optimising the cookstove label designs. This approach hinges on a systematic way of measuring a phenomenon through a series of tests to arrive at an optimised design. The Energy Commission (EC) designed an initial cookstove label which was tested across all targets via FGDs and KIIs. The subsequent design and optimisations of the labels were done by SCANAD – design and advertising firm. They observed the FGDs to get first hand reactions to the design by consumers which informed subsequent work on the labels. This process was followed through until a much more appealing and comprehensive label with fewer miscomprehensions was arrived. Kantar engaged all other stakeholders including EC and CLASP for immediate reactions and feedback on the optimised labels which helped the team to agree on acceptable, fuel neutral, universal, simple and appealing label. Figure 2 shows the evolution of the labels from the concept stage with varied designs to a final optimised label. For each label design, key thematic insights shared and interpretations given on the label features by the FGDs have been captured as headlines and summaries. In general, the initial stove design proposed as a feature to specifically associate the label to an improved biomass cookstove was misconstrued to imply the cookstove could use multiple fuels. Hence, modifications were made to the stove design based on feedback received to address identified areas or features of confusion.

⁹ Sequential monadic testing is typically the best method for product testing or product optimisation and involves showing one piece of stimulus at a time and also showing other alternative design, and sometimes several additional designs. https://www.decisionanalyst.com/services/testdesigns/



Next optimised labels





Cookstove design: Identified as cookstove, traditional coal pot

Fuel types: Identified as cookstove of all fuel

Combustion: Flame is evenly distributed and associated to good performance of cookstove type and even LPG

Areas of confusion: Universal label but is

perceived as the old coal pot mostly



cookstove, traditional coal pot Fuel types: Identified as cookstove of only Areas of confusion: Not a universal label Combustion: Flame is evenly distributed and associated to good performance of Cookstove design: Identified as Preference: Medium charcoal fuel type cookstove



* PM2.5 value* MAX POT SIZE: 10 L EMISSIONS: APPLIANCE: BRAND: MODEL:

"The actual fuel efficiency and emissions will depend on how the appliance is used and where it is located. See product brochure for more information.



Not a typical firewood stove, cues labe for new product

Cookstove design: Is not really seen as Combustion: Flame is evenly distributed the tripod for the firewood but seen as a and associated to good performance of -uel types: Identified as cookstove of new stove to use firewood Preference: Medium only firewood cookstove

Areas of confusion: Not a universal label







ENERGY COMMISSION

Optimised label



No specific fuel types, upper part of the stove was made a bit thicker and cues a universal stove

Preference: High

Cookstove design: Identified as NEW cookstove, with a heat

retention feature

Fuel types: Universal

Combustion: Flame is evenly distributed and associated to

good performance of cookstove

Areas of acceptance: Fit all brands of popular improved

cookstove

Final changes made: White stars taken out to reduce the confusion of the rating

Thickness of upper part of stove reduced and colour made neutral to take out association to brand specifics

'Emissions approved' was put in a hologram

3. Approach to Data Analysis

Justifiable qualitative approaches were used to analyse the data and depict results in very distinct analysed Key Performance Indicators (KPIs). Content analysis was used to bring out the threads across the responses in the FGDs and KIIs across various variables of interest. Findings were aggregates of statements that correspond with what majority views were. Story telling style was used in reporting along with clear assessment indicators to provide insights and context to which conclusions were made. It is imperative to note that this is solely a qualitative study and the findings, which may not be generalised, shows good reflections on the targets or subject included in this study.

Analysis and descriptive assessment of the Key Performance Indicators for the labels were done across the specific KPIs as displayed in the Figure below.



4. Findings and Insights on Cookstove label

4.1 Introduction

This chapter reports on the learnings gathered from the study in context to the questions asked in order to help the Alliance and partners to achieve their objectives. The findings have been presented in a systematic way to enhance comprehension on issues, assess performance on indicators and also appreciate the findings in a disaggregated manner across the various targets for the FDGs and KIIs.

4.2 Understanding the Ghanaian consumer in relation to labels on products

4.2.1 Relevance of labels on products

Labels serve as source of information

Generally, the concept of standards and labels for products is relatively high among Ghanaian consumers especially with regards to labels for electrical appliances including fridges, air-conditioners and household consumables and consumers easily identify with these standards. However, labelling for cookstoves is relatively new and unexplored among consumers in Ghana. In this survey, consumers were asked what exactly they look out for in products before purchase is made. This was to assess whether they ever consider product labels as an important driver for purchase decisions. Most consumers indicated that the first thing they look out for is the expiry date, if it is a food item, and labels to determine whether the product is original or a fake product. Hence, labels serve as a means of identification, proof of originality, quality and proof of wholeness of the products they purchase from various outlets.

"Please, this thing you are talking about, I have some education, so I look for expiry date and go for one that has a longer expiry date" (Consumer, Kumasi)

"I will look at the expiry date and also look at the neatness of the environment and the neatness of the vendor" (Consumer, Takoradi)

From the perspective of retailers and institutions, labels play a key part in determining the kind of product they purchase.

"Well it depends on what I am going to buy. Let us assume that I go out to buy a fridge, those times I would just buy anything at all but now Energy Commission has drawn our attention to the fact that some of the electrical gadgets consume more power than others. Because of that they gave us some stars, five stars, three stars to look out for. So now if for example I am going to buy a refrigerator that is what I look out for" (Retailer, Takoradi).

Labels were generally seen to connote a sense of approval from an authorised body. This, in the view of consumers, serve as a means of authenticating the genuineness or otherwise of products. The main line of contention was with the influx of fake products on the market which mimicked original labels which is difficult to detect. This, in the view of some consumers has made it difficult to differentiate between products that are fake and original.

"There are fake ones; there are some products that you can see that the labels are not original labels. They have removed the original labels because the products have expired and so when you are buying something and you are not careful with the label you may end up buying an expired product because they put a different label on the product. And when it is expired they don't put the date on it, they write a different date on it. Yes, I want to add up to what the lady said. If you don't know how to read and you get to a store there are some things that will help you know which products are of quality. If you only consider the label, then you will buy things and come home only to realise that the quality is not good" (Consumer, Accra).

Labels communicate trust

Most consumers perceived labels as means of authenticating the genuineness or otherwise of products. Although labels were largely not fully read, they serve as reliable proof of originality of the source of the products. This has become imperative given that Ghana operates a free and liberalised economy thereby increasing the influx of fake and cheap products into the market. Hence differentiating products beyond price is a big challenge for the masses of consumers.

"This will let me know that what I am buying is good and will last for a long time" (Consumer, Kumasi).

"It helps to differentiate between the original and the fake. I believe in labels because even if they make fake ones, it can't be like the original" (**Consumer, Accra**).

4.2.2 Literacy and reading of label content

Although, consumers admit that labels are relevant and crucial to purchase decisions, majority of people either do not read or are not able to read or find contents of labels not readable. This is predominant across targets of various literacy levels and can be attributed to illiteracy or lack of a citizens' campaign on the benefits of reading labels. Thus, there seems to be a direct connection between level of education and the desire to read label contents among consumers.

"Maybe the products are two and I am not literate and so I will not be able to tell which one is original but you are learned and so you can tell which one is original and which one is not and you will buy the original one" (Consumer, Accra)

"As for me when I go and buy it I come to show it to my child to read it for me. If I find out it is not good I return it" (Consumer, Kumasi)

"Yes, it helps you know what you are buying. For instance, if I go to the market and I want to buy something, it is the label that is going to help me know that this is the product I want. So, label is something I really consider because some people are in the habit of misleading others into buying products different from what you know because they have deliberately labelled it with labels of popular brands" (Consumer, Accra)

Consumers who cannot read however, have certain features they look out for in terms of ascertaining the quality of products.

"Because I cannot read, when I go to the market to buy something, I look at the weight of the product to know if it is good or not. The weight of the fake ones is always very light" (Consumer, Takoradi)

The situation appears to be different from the perspective of retailers and institutional users. There is a certain level of consciousness in label reading and utilisation across regions among this segment. This obviously is driven by the fact that procurement of goods and services for institutions are standardised and needs to be an informed decision on choices made. Hence, the targets confirmed the need to always either do due diligence and find out more on what they buy on behalf of their institutions.

4.2.3 Product labels and performance labels

In general terms, consumers used product and performance labels interchangeably although a few can differentiate between them. Most of the references made with regards to what consumers look out for before purchase decisions are made were directly linked to the description of product labels which is defined to include product branding, the expiry dates and the nutritional content. Performance labels were not mentioned at all at this stage among consumers.

Institutional users and retailers however understood the differences between product labels and performance labels. Much reference was made to standards that come with the labels than with specific product labels. Though the level of understanding is appreciable, there is still a need for clearer messaging and communication campaigns among the various targets.



"Yes, the Ghana Standards Authority. They said it saves power but those that are imported, they complain about the power. A friend brought the same type of fridge from London but it is not working here so they said it is the difference in the voltage but she said it was working there. It is energy saving label" (Matron, Accra Academy)

4.2.4 Awareness and reaction to existing energy efficiency labels

Generally, there is high awareness among consumers with regards to energy efficiency performance labelling for electrical appliances including refrigerators, air-conditioners, bulbs, etc. Most of the examples cited when asked about what they look out for in purchasing products were referenced to performance labels on fridges and other appliances. Though the level of awareness of these products seemed to be high, comprehension of the various features was low across all targets. The standout point was the general view about the label serving as an endorsement of the product from approving authorities. This point was very clear across all targets, though consumers are not making much purchase decisions based on the current performance labels for their energy appliances.

4.2.5 Overall reaction to optimised cookstove label design

The label design is generally appealing to all targets. Consumers find its colours attractive, and see it as having a strong appeal, simple without any confusion, has strong association to product and perceived to be Ghana branded which instigates pride and strong sense of ownership. Spontaneously, striking features that were coming up were the cookstove design and the stars. The cookstove design was a strong evident feature that was central to the label for easy identification and product association. The overall impression is that the label is unique.

"I like it very much, the colour is nice and I like the way the whole thing has been done" (Consumer, Kumasi)

"This design is very...very good paaa for us. It is better than the ones I see on other things" (Consumer, Takoradi)

4.2.6 The cookstove design

The cookstove design was intended to represent universal cooking stove which can easily be identified and not brand bias. The design delivered on it and consumers could associate it to all kinds of cookstove. Also, it sought to cue a new improved stove and not the old traditional coal pot which was progressively achieved across the process of optimizing the labels.

"I can see cookstove. I think it will be a stove. Any kind of stove" (Matron, Adabraka Polyclinic, Accra)

"It looks like a new type of Gyapa" (Retailer, Kumasi)

Also, the label depicts a universal cookstove that is not fuel specific, thus, it does not indicate whether the particular cookstove upon which the label will be put uses charcoal, firewood or pellets but rather, it can be put on any cookstove which the technology is approved to be efficient and gives the right levels of emissions. Symbolic display of fuel type on the initial cookstove designs was leading to consumers perceiving the stove to be suitable for a specific fuel type i.e. charcoal, firewood etc. which made the label not neutral enough and so the fuel type was completely taken out of the design. Consumers, thus, understood the universal use of the label across fuel types when the concept was explained.

"It is about stove. It is also telling me that it can use any fuel at all" (Consumer, Takoradi)

"This I think doesn't say the type of fuel it uses ... maybe it uses charcoal or firewood" (*Retailer, Takoradi*)

"I can see something like a modern coal pot. Like new one. Charcoal stove. I think the coal pot we use is different from this one. Because they have written charcoal stove on the label which means it is a new model" (Consumer, Accra)

"I can see cookstove. I think it will be a stove. Any kind of stove that uses any kind of fuel" (Matron, Adabraka Polyclinic, Accra)

4.2.7 Stars

The stars on the label were depicted in two complementary ways. The first approach was to have separate stars in a half-cyclical format and in a ranking order indicating the energy efficiency levels. The second approach was the design of a star icon having a figure in the middle of the star beneath the cookstove. These two display were largely complementary and for design purposes. Interestingly, consumers comprehended this intended purpose and got the logic of the stars with figure in relation to the number of stars in the half-cyclical shape. There was no significant confusion in relation to this.

Comprehension of stars and the number of stars

Identification of the stars was fast but comprehension and association to energy efficiency was largely low among all consumers. Some consumers associated the meaning of stars to quality

of service, level of patronage, durability, standard ratings and heat regulators which were technically not right in context of what the stars represented on the label. This had diverse associations which largely deviated from communication on efficiency, level of performance of the cookstove given the efficiency of the technology. Although a few related the stars to efficiency of the stove, especially the institutional and commercial users, it was largely referring to the performance of the stove rather than efficiency of the technology.

Implicatively, the number of stars influenced the ranking and rating concept it cued to consumers. Thus, consumers understood the issue of the higher the number of stars, the higher the quality of the product. The most common phrase consumers associated with the stars is "More Stars, More Quality".

"The stars mean it will be very quality. Because when we say someone is a star or an artist, it means the person is good" (Consumer, Accra)

"Please I have something to say. I am a social media fun and we have likes on social media so I think the star is rating. So, the three stars is just the rating so it means it is high quality because it is three out of five" (Consumer, Accra)

"It shows the strength of the fire or the heat" (Consumer, Accra)

Nonetheless, this trend in wrong associations of stars to parameters other than energy efficiency was highly skewed to the illiterate group and a few literates who are traditional charcoal and firewood users who were engaged in the discussions. However, a few could associate the stars to good performance and efficiency of the stove.

"The stars are more so it means it will work well. It means it will work well to your expectation. You see that there are three black stars, so the stars represent efficiency and the more stars are represented by the three stars there. That means that it will help us not to waste money, you will rather save some money. It will work better. Maybe instead of buying my regular GHS 5 charcoal I will use only GHS 1 with the new coal pot; that means it is efficient" (Consumer, Accra)

"The stars to me mean that the stove is good for us to use and it will last long and work well" (Consumer, Takoradi)

Some consumers in Greater Accra associated the stars to Ghana, since the star is a symbol on the national flag and in particular some consumers from Ashanti Region, associated the stars to a product made for 'blacks', thus, the colour of the star meant it was to be used by Africans.

"The stars there represent Ghana because usually when Ghanaians come out with products they imprint the stars on it to indicate it is made in Ghana. Also, there is no other African country that uses the black star apart from us. So, anything black star represents Ghanaians" (Consumer, Accra)

Also, retailers and institutional users made the same association of stars to quality: 'a product that is good', and '...of high quality'. Thus, the stars only echo quality from the perspective of the various target groups and not specifically on how efficient the product is.

"The stars that I am seeing here, the three stars show that there has been an improvement. Ghana is making progress. There are five boxes but three stars have appeared so it means that we are moving forward, we are advancing in our charcoal use. We will no longer use so much charcoal like we used to. This means that the stove will help us. This three here means we will have less heat and a very neat environment" (Retailer at Makola, Accra)

The stars, thus, generally cued very low association with energy efficiency and rating across all targets. However, the slogan "the more stars, the more efficient" is seen as a catchy phrase and can be maintained (see Figure 3 for details).

A few of the control target, that is the Gyapa and LPG users could read and try to interpret the slogan but still lacked the understanding of the efficiency in relation to the technology of the cookstove.

This was not different among the retailers and institutional users who tried to explain the English phrase and link it to stove performance.

However, upon introducing the concept of efficiency and explaining the meaning to consumers, they are able to appreciate the ranking of the stars and the variation of the number of stars. Some consumers could further tell that a one star stove will perform less to a three star stove. The concept on ranking was then comprehended.

"Well, as my sister said, the stars will mean that I will use small charcoal or firewood and my cooking will be ok" (Consumer, Takoradi)

"You see, what they have written on the label is the 'the more stars, the more efficient', so I think it means the stove will work very well since there are 3-stars on it" (Matron, Kumasi)

"It means the efficiency of the stove is high. It means its performance would be high or it is good" (Retailer, Kumasi)

"Well here it says that the more stars the more efficient. This means that the more stars on the label then the better the stove" (**Retailer, Takoradi**)

4.2.8 Efficiency level

The number of stars and the slogan were all aimed at communicating the levels of efficiency of the improved cookstove technology. Also, a text to depict the efficiency level was captured as "this stove's efficiency XX%". Although this text was not usually noticed or read at all, it aimed to communicate the efficient technology of the cookstove.

During the discussions, consumers espoused their ideal cookstoves, the features and expectation on performance of the stove. Some product comparisons across the improved cookstove category were discussed and strong features that came up included – the technology of the cookstove that aids heat retention so that users buy less fuel and can cook longer and effectively. Other associations included: a good performing cookstove which heats and works properly without "undercooking food" or "burning food" and is durable, strong and of the highest quality.

So, close brands of products that consumers who have either used or heard of were the "Gyapa" stove, "Ahibenso" and "Obaapa".

Hence, consumers associated efficiency to the stove technology that can aid heat retention. This can be visible as obviously shown with the clay lining in the "Gyapa" brand or the heaviness of the metal of the stove. This insight led to the display of the concept of efficient stove to be "having a thick lining which has the capacity for heat retention". Although the pictorial association of efficiency may not match the concept of efficient technology technically, consumers resonated much more with this point of view. Though some stoves with thin lining can be more efficient than brands with the thick metal, the Ghanaian consumer is yet to comprehend this and always associates quality to the thickness of the cookstove lining. This wrong technical association might lead to some consumers rejecting cookstoves with thin lining and this will require a level education to dispel this wrong association.

Figure 3: Summary of the stars and the slogan: "more the stars, the more efficient"



Colour code: Green – good (correct association), **yellow** – average (appreciable level of association), **red** – poor (wrong association)

4.2.9 Emissions approved

An emission approved was depicted by a hologram with the inscription, "Emissions Approved", inscribed in it. This served as a seal of authority from the standard approving authority and was seen as EC's anchor feature or a stamp for clean energy, hence seems right to have the emissions approved text in a hologram as part of the performance label based on insight gathered from consumers in optimising the label.

Generally, this concept, from the perspective of consumers had much connection to the combustion level of the cookstove and was interpreted as the ability of the cookstove to burn well without smoke and thus seen as "environmentally friendly" cookstove. The clear grey smoke affirmed the consumer's perception that emissions approved meant the good levels of combustion of the cookstove. Nonetheless, in Takoradi, some consumers interpreted emissions approved to be an endorsement or approval stamp on the cookstove with little relation to the gas emission. This feature was also seen as an anchor feature from which health and environmental benefits laddered.

The following views validate these findings.

"It means that the level of the fire will be in such a way that it will cook at a low heat and yet it will cook the food fast and it will not burn your stews; you can leave your stew on fire and go and bath and yet it will not burn" (Consumer, Accra)

"It means that the smoke that will come out will not be seen. I think there will be something to retain the ashes from the cookstove" (Consumer, Accra)

"It means it has been accepted. Approved means it has been accepted but I don't

understand the emission. I think it means everything about it has been accepted. It means the heat from the fire is very high" (Consumer, Takoradi)

Retailer views were quite different from what consumers had espoused. The emphasis was on approval of the cookstove by authorities mandated to ensure that the best of products come onto the market. Names of such authorities including Food and Drugs Authority and Ghana Standards Authority were cited.

"That means that the work the cookstove does has been approved. I see approved here, that means it has been approved. If it was not healthy then it would not have been approved. There is no way the government will approve a product that is not good for our health" (**Retailer, Accra**)

"There are some products that do not have any approval like an approval from standards board or food and drugs board so this means that a certain authority has approved of it. Well, you can't just manufacture anything and bring it on the market, water for instance standards board has to approve of it. So, this means that authorities have approved of it" (**Retailer, Takoradi**)

The perspective of institutions especially the matrons of schools and hospitals was similar to that of retailers. They associated this largely to a kind of official endorsement from regulatory body.

"Maybe like Ghana standards board or any other company that can guaranteed that this product is very good or it has been registered" (Matron, Fijai Secondary School, Takoradi)

"It means that everything has been tested before it is brought for us to use" (Matron, Adabraka Polyclinic, Accra)

4.2.10 Emissions level

This was displayed with a dummy figure as 'PM2.5 value*'. Generally, this was seen as a technical language, a difficult concept to understand especially across targets and mostly not mentioned at all. This was equally not well understood by the uneducated but had appreciable inferences from the elite. It was interpreted as "environmental friendly" fuel, complete combustion with no smoke. Also, the clear grey smoke gave them some "reason to believe" to this emission approved text. All health and environmental benefits were laddered from this and resonated well with users (see Figure 4 for details).

From the perspective of consumers, emissions approved cued more with flames other than with approval of a particular brand. The following views validate this finding.

"It means that the level of the fire will be in such a way that it will cook at a low heat and yet it will cook the food fast and it will not burn your stews; you can leave your stew on fire and go and bath and yet it will not burn" (Consumer, Accra)

"I also think that in case coal pot is labelled with two stars, it will mean that the device with this number of stars is more convenient and better than the coal pot. It means it has been accepted. Approved means it has been accepted but I don't understand the emission. I think it means everything about it has been accepted. It means the heat from the fire is very high" (Consumer, Accra)

"It means that the smoke that will come out will not be seen. I think there will be something to retain the ashes from the cookstove" (Consumer, Accra)

Figure 4: Summary on emission level



Colour code: Green – good (correct association), **yellow** – average (appreciable level of association), **red** – poor (wrong association)

4.2.11 Labelling text and other features

The label design had a few text inscriptions either providing much more information on the graphical designs or new information which is not pictorially displayed. These included the appliance type and fuel types, brand, model, maximum pot size, and emissions. Other pictorial features include a national flag and hologram (with emissions approved inscribed).

Brand - The brand was depicted by the letter 'A' which is a dummy variable to represent any brand. Upon explaining to consumers, some common brands that were identified by them include 'Gyapa' brand and the 'Ahibenso' brand.

Appliance - This appliance was basically understood to be referring to the improved cookstove.



Fuel type - The consumers understood that specific fuel type will be provided depending on the type of cookstove.

Model - The model was tentatively displayed with dummy variables 'ABC/123'. This text feature was not so prominent in the discussions though consumers were made aware that this was just to represent the model name and that the final product will have the actual model name on the label.

Max pot size - The pot size was depicted with a dummy figure as well '10'. It did create some interest from consumers in relation to the sizes of the stove that will be on the market but much more among institutional and commercial users. The various targets were made aware that the size will vary across product types and that the size as inscribed on the label was just a prototype.

Figure 5 summarises insight gathered on consumers' comprehension and association on the relevance and benefits of information provided in text on the draft cookstove label.



Figure 5: Summary on labelling text

Colour code: Green – good (correct association), **yellow** – average (appreciable level of association), **red** – poor (wrong association)

Flag - The flag is embossed on the label to signify the country of origin of the label design. This basically cued a "product made" in Ghana across all targets. This was a unilateral view across all targets.

Hologram - The hologram was used as an additional feature on a performance label to show a distinction between products that have passed the minimum emission requirement test and those that have not. This concept was associated with the combustion level of the cookstove

and was interpreted as the ability of the cookstove to burn well from the perspective of consumers. The institutional users and retailers however saw it as an endorsement or approval stamp on the cookstove with little relation to the gas emission.

4.3 Benefits of the improved Cookstove technology and features of the Label

Labelling programmes on energy efficient appliance or technology have been a key driver for eliminating low-cost, inefficient models and replacing them with efficient and low emissions technologies, thereby improving the overall energy efficiency levels. Energy efficiency labels which are affixed on manufactured products provide information to consumers and buyers about their efficiency rating or estimated consumption of energy as referenced in other studies. This enables consumers to make an informed purchase.

Relative to this study, generally, the optimised label delivers on this overall purpose for communication although it is very simple and still has some less comprehended features like "efficiency" and "emissions approved". Though both concepts were hard to technically understand, consumers find the efficiency terminology much easy to grasp than emission level concepts.

4.3.1 Functional benefits

Generally, the consumers were better able to strongly articulate an overall sense of quality of the product, rather than specific aspects of performance and quality. However, despite misinterpretations of performance and quality concepts, consumers had a better understanding about the possible benefits from the stove based on information on the label.

Consumer perspective to functional benefits was laddered heavily on the performance of the stove and its quality. Consumers could not easily associate the technology of efficiency of the stove to its functional benefit. However, when the concept of technology was explained, this laddered into all the other implied benefits including health, environment, social and safety benefits. The perspective of retailers and institutional users were not so different from the views of consumers.

4.3.2 Economic benefits

This was implicitly referred from the benefits that current improved stove is offering and also confirmed when the consumers understood the concept. Key economic benefits that consumers implied from the technology are low fuel usage, hence cost saving and higher combustion rates which culminate into low-expenditure on fuel purchase.

They further explained that the economic benefits derived from energy efficiency labels has direct bearing on financial savings derived from using less fuel (efficiency) and the reduced cooking time as a result of high fuel combustion. The financial savings made on fuel usage, can be used to cover other family needs while the savings made on time can be used for other productive activities for money. All these lead to greater family savings and comfort in the long run. The low smoke (combustion level) generated also meant there would be less smoke-related diseases and less expenditure on family health as espoused in the following statements:

"I think that looking at this cookstove, it requires small amount of charcoal which means you are buying smaller amount of charcoal. It saves money" (Consumer, Accra)

"Looking at the label, considering the type and the model I think that it will be time saving because if you look at maybe compared to charcoal or firewood, the number of hours you will spend in cooking will be different from this one. This will not take much time and you will have more time for work and make more money" (Consumer, Accra)

"We will not waste too much money on charcoal. That will reduce cost. You will not waste money, you will be saving money" (Consumer, Takoradi)

"It helps us save money because we use less charcoal. We don't also get sick because there is very little smoke and we don't spend money too at the hospital" (Consumer, Takoradi)

Benefits from the perspective of retailers was implied and laddered from the key features on the label and understanding they gathered from the features on efficiency. Retailers also associated the economic benefits from the perspective of using less fuel (efficiency) in cooking, thus, spending much less on fuel and making family savings.

Retailers are able to sell their products to customers using the implied economic benefit as key selling point to drive consumers purchase. In their view, economic benefit of products play important role in household choices and "trade off" between various products, as consumers seek to save money on most purchases they make.

"There are some people who will still want the old coal pot even if you explain to them that this is improved. But once you tell them that, if you buy GHS 20.00 worth of charcoal you can reduce it to GHS5.00 and it can equally cook all your meals, they will be interested" (**Retailer, Accra**)

"Maybe if you want to use it you will not put in too much charcoal. It is economical for the family, you will not have to spend money on the cooking alone, you will have enough for other things so that is how I see it" (*Retailer, Accra*) "It will save money and time. The time you would have used to go around looking for more fuel will be cut off. You will use the same amount of fuel over a longer period of time. It will bring me more customers. I will make more money because a lot of people will come and buy it. You will be well known as well" (**Retailer, Takoradi**)

"One of the benefits will be that, let's take for instance if I would have bought two bags of charcoal for two months and now due to the stove's efficiency I can save on one bag then that means I can use the money for the other bag for something else. Isn't it? So that means I will save money. So just like the refrigerator, those times we were paying more for light bill but now that we have the new type now we don't have to pay so much so we are saving money in that area" (**Retailer, Takoradi**)

The institutional users shared the same point of views. The emphasis was on spending less in terms of fuel usage in the preparation of food which meant more profit for the local restaurants. In their view, the less smoke generated from the use of improved cookstoves with labels brings them more customers because cleanliness of the cooking and eating areas promotes patronage which increase their sales, and reduces the expenditure on health-related issues of their workers.

The emphasis from the perspectives of matrons in schools is the benefit they get in having more fuel savings to increase the quantity of food items purchased for the students. The hospitals espoused the economic benefits in relation to time savings they make in preparing food for large number of patients.

"Let's say if we use GH¢10 charcoal daily to cook fufu and palm nut soup and this one is going to conserves energy and it is going make me use like GH¢7 charcoal have I not saved cost? The same procedure - every department here has some quantity of charcoal allotted to them daily so if one department ends up using less fuel than usual then you would have some spare money to do other things" (Local restaurant, Accra)

"It will help my business to expand. Even those working under me will benefit because I will increase their pay when I make more profit. And they will be motivated. It will save them from getting sick. The smoke is not good for everyone. Sometimes the workers cough too when they work in smoke and it is not good for their health. So, when we use this one, they will not fall sick like the first time. Our pots will not be black again. It saves us the energy of washing the pots" (Local restaurant, Takoradi)

"We will also close in time and it will save the workers time. They will rest well when we close early" (Adabraka Polyclinic)

"It would benefit us to save money which could be used to increase the quantity of food items so it would benefit the students get more food and they would be happy" (Nobisco, Tamale)

4.3.3 Health benefits

Labels are seen by consumers as a symbol of confirmation that products comply with certain health standards (Lin & Huang, 2012). The health benefit is generally associated with the indicative less smoke and therefore less inhalation of the smoke with its accompanying reduction in eye and body effects.

From the perspective of consumers, the health benefits are directly related to the less smoky nature of the cookstoves resulting from the good combustion levels. The white smoke which is inferred by the colour of flames emitted in the designs ladders into good gas emissions for such technology and is very much liked by consumers. So, consumers laddered the benefit of approved levels of emissions to reduced emissions of black smoke and particulate matter, hence less bad smoke inhalation and irritation of the eyes. This will have significant health benefit by reducing asthmatic attacks, eyes disease, cough, and chest related illnesses.

"Looking at the level of the fire, you will see that it won't give out much heat which is good health-wise" (Consumer, Accra)

"Once it doesn't cause smoke and does not overheat it can be used anywhere. If you are cooking a lot of food you can use it without the house getting hot because sometimes when you are cooking a lot of food there is heat in the house. And even when you are using this one it will make you look neat because there is no dust from it" (Consumer, Accra)

"Smoke can make us sick but with this one if the fire is high, it has moderate heat and does not cause any side effects" (Consumer, Accra)

"You won't have smoke in your eyes. Sometimes the smoke that comes out is harmful to our health, it affects our eyes. It does not produce smoke and so it is not harmful to our health" (Consumer, Takoradi)

"With the local coal pots, the ash that comes out is too much and we end up inhaling some" (Consumer, Takoradi)

The perspective of retailers hinged on the marketing advantage in selling improved cookstove with labels that depict health benefits. Marketing cookstove that emit very little or no smoke gives retailers competitive advantages and makes marketing much easier since health-friendly cookstoves resonate easily with consumers. In the view of retailers, the chop bar operators will be huge beneficiaries of this since they are exposed to so much heat because of the quantum of food they prepare every day. These are espoused in the following statements:

"It is helpful; It doesn't produce smoke and there will be no heat around you. You will have good health. Too much smoke is toxic but this won't be harmful to users because there will be no smoke. There will be less smoke as well because you won't keep the fire on for long" (*Retailer, Takoradi*)

The institutional users also validated the perspective of the other stakeholders. The other point of emphasis is the impact of smoke and heat on the people they serve i.e. students and patients alike.

"Since their service involves cooking for a large number of people, it implies if the cookstove generates so much smoke and heat, the impact will not only be on those doing the cooking but on the students, patients and customers" (Customer, local restaurants)

"Kind of heat coming out of the fire and even from the pot itself is not safe for us doing the cooking and for our customers. Sometimes when you are working with people you have to also think about their welfare a bit. Before the gas, we used to use firewood and that too comes with smoke entering your eyes and all that. When I inhale it, I get some kind of infection in my head" (**Restaurant, Accra**)

"You know emissions can cause sickness. This place is for patients even pregnant women come to sit here. Those with asthma are at risk because of the smoke but if it is good all the pregnant people can sit here and eat" (Adabraka Polyclinic)

4.3.4 Safety and social benefits

Safety basically didn't have strong association to the labels but people think since it reduces the amount of fuel used coupled with the model of stove, you can use it in an enclosed space and still feel safe. Safety thus, cued family and societal wellbeing from the dangers of using unimproved cookstoves without labels.

"That means that you can use it anywhere. You can use it in your kitchen; you can use it in your bedroom. Maybe someone lives in just a single room and does not have a kitchen; she can cook in the room without getting any side effects. There will be no smoke or dust there" (Consumer, Accra)

"You will realise that you don't have particles of fire to move around to cause any harm" (Consumer, Takoradi)

"The people I work with and I will all be safe; the heat will go away and we will not get sick. Also, the ash that comes out makes the places dirty and we have to sweep all the time so with the new stoves the place will be neat" (Consumer, Takoradi)

"It will be safer for the community, the town and the whole country. Because if am using this and I don't have an issue like what I will experience with fire from the firewood, then I don't have a problem. It will be safe for everyone in my home and in my family. The ash doesn't also spill out so much. And you will notice that as soon as you light more charcoal, the ash in the oven also heats up and that is what keeps the lining warm" (**Retailer, Takoradi**)

4.3.5 Environmental benefits

The environmental benefits laddered from the label features and as such the implied benefits from the efficiency and emission levels. The benefits were largely associated to the less smoky emissions from using improved cookstoves and with the less emission of heat. From the perspectives of consumers across the regions, using such a cookstove with such a label will basically keep their homes clean from smoke and ashes and this will help maintain tranquillity among neighbours.

"It will not bring out smoke to enter people's rooms and when someone has hanged her clothes there will be no smoke in the things, the smoke will not bother people. It will not enter people's rooms" (Consumer, Accra)

"I will not fall sick. The benefit is that it will not bring out any black smoke and so if it is raining you can take it inside and continue preparing your food and there will be no black smoke" (Consumer, Tamale)

"The way the design is, where the ashes will be falling your place will be clean. It won't dirty the environment" (Consumer, Tamale)

Retailers, however, associated the environmental benefits to the general preservation of forest reserves through less use of biomass fuels (charcoal and firewood).

"There are a lot of benefits; we will not have to cut down so many trees. Cutting down trees is not the best especially during storms, roofs will not come off and our water bodies will be saved" (*Retailer, Makola Market, Accra*)

The institutional perspectives generally corroborated the views espoused by consumers. The emphasis was the less smoky nature of improved stoves which translates into cleaner environment and ensuring friendly neighbourliness.

"The smoke will not even disturb the workers around" (Matron, Adabraka Polyclinic) "They will also benefit because the place will be very cool for them to sit, the smoke will not smell in their shirts and the environment can also be cool because the heat in the kitchen cannot transfer to the sitting area so it will be comfortable for them to sit if there is no smoke coming" (Matron, Catholic Hospital, Tamale)

"Assuming you are operating in a rented apartment, the other tenants will not be happy with you because of the smoke" (Yesu Mo Local Restaurant, Tamale)

4.4 Influence of labels on purchase intentions

Factors considered for the choice of cookstove is generally not complex, largely, key drivers include durability which is related to the heaviness of the metal or stove, good combustion, availability, access and affordability of the fuel type required. The Ghanaian market has not largely been exposed to improved stove technology or do consumers have a clear understanding of efficiency of energy saving appliances, hence, efficiency of the technology has not been a driving factor in the choice of energy products. However, given the findings of this research, across all targets especially consumers, there is a high likability and interest in such improved technology because it fundamentally seeks to provide added value to the improved product given the implied benefits it offers aside the functional requirement of a cookstove.

These implied benefits seek to offer consumers strong sense of care and good wellbeing which always provides additional reasons for choice of products and services which this label and concept has delivered on in the minds of consumers. Hence, consumers are excited about the technology and are willing to buy an endorsed cookstove with labels.

However, given the fact that the market is nascent and also most current purchase of electrical appliances is not driven by the energy efficient labels, consumers do not think that having a product performance label is enough to guarantee purchase especially among the illiterate and low earning group. They will need product level education and recommendation on the product features and functions to equally influence their purchase decisions. Warranties on the product were also major influencers of purchase decisions. Nonetheless, for institutional users and retailers, performance label on products signifies that all regulatory standards have been complied with and therefore products will largely deliver on the specifications and



deliver consistency in product manufacturing. This will boost the retail market and promote market growth because when consumers like and trust the products, they serve as unofficial marketers of such products, leading to additional customers.

"I will buy a cookstove with this kind of label on it because I can see it will work well...I will try it first and if it is good, I will also tell my friends and family to also buy cookstoves with this label on it" (Consumer, Accra)

"As for me I will buy it...from what I have learnt about it, I know the cookstove with this one on it will work well, so I will buy it and tell my friends to try it too" (Consumer, Takoradi)

Most customers in the Northern region though will prefer to have cookstoves with the labels on them, price of the product is a key driving force in purchasing decisions. They perceive label cookstove will attract premium price.

"This is nice and I like to have my cookstove with this label on it but I might not be able to buy it so will have to use my local one with sawdust" (Customer, Tamale)

"If the price is not too expensive I will buy it because the ones with the labels are very good" (Consumer, Tamale)

"As for me, if what I want to buy does not have any label on it, I don't buy, so if the cookstove has this nice label on it, I will surely convince my school to buy" (Matron, Fijai Senior High, Takoradi)

"The customers from the schools and those who prepare food for a lot of people always ask for cookstoves that are known on the market" (**Retailer, Accra**)

"Well, it looks good but the price might not favour people like us" (Consumer, Tamale)

"I don't think I am in the position to pay more since my financial level is not very strong though I will prefer the new ones" (Consumer, Kumasi)

"I won't mind paying more but it will reflect in the price I will sell my product for so and customers won't like that" (Retailer, Accra)

"Yes, because that is the environmentally friendly ones" (Retailer, Accra)

"Not in the beginning, they won't really see the point but after much advertisement and education, they will come to see the point" (Retailer, Takoradi)

4.5 Summary of findings

The key findings of the survey on performance labels, are summarized below:

- Overall, comprehension of the performance label varied across the different label features and across all stakeholders;
- The initial label design was generally associated with the 'Gyapa' brand which is an improved cookstove in Ghana. Though different associations were made by various stakeholders spontaneously, the central point was the association to a kind of improved cookstove;
- Consumers seemed to be familiar with the concept of energy efficiency labels especially with electronic appliances including fridges, but do require more awareness campaigns for better understanding of the specific features and ideas communicated;
- The number of stars also cued more efficiency, less use of cooking fuel and produces less heat; The stars in the label also cued high quality of product, thus, the higher the number of stars, the higher the quality;
- The concept of energy and fuel efficiency was largely understood in relation to usage of less fuel and the quality of the cookstove;
- Emissions approved was seen as a technical language, a difficult concept to understand especially amongst the less educated, however, retailers and institutions placed the emphasis on approval of the cookstove by authorities mandated to ensure that the best of products come onto the market;
- Health benefits were generally associated with the low smoke generation which culminated into a reduction in the possibility of consumers suffering from smoke inhalation and heat related diseases. Further association was made to cleanliness that comes with the less smoke and the less ashes generated which is directly associated with good health. The perspective of retailers hinged on the marketing advantage in selling improved cookstoves with labels that depict health benefits;
- The economic benefits derived from energy efficiency labels hinged on the financial savings derived from using less fuel and the reduced cooking time as a result of high fuel combustion.

5. Conclusions and Recommendations

5.1 Conclusions

It is imperative to always seek consumers' views on what products, services and communications that are targeted to them so it can resonate and give the expected outcome. This research sought to optimise the label targeted to inform users and retailers on improved cookstove technology and also get insights on their will to influence their purchase behaviour.

Overall impression of label design and relevance to the communication of the improved stove technology

There is strong likability for the design although the overall level of comprehension of the specific label features is low especially among consumers with low levels of education. The design is generally attractive and appealing to all targets especially with regards to the colour features and the flag of Ghana which kindle a sense of pride. The overall impression is that the label is unique and is highly acceptable across targets.

Key areas of comprehension

Generally, the level of comprehension of the cookstove label was low across all targets with regards to the specific label features. Comprehension and association of stars to energy efficiency was largely low among all consumers though identification was fast and easy. The areas of associations bordered on quality, durability, and level of standards which deviated from communicating efficiency of the cookstove. However, the level of comprehension on the phrase, "More Stars, More Quality" was high across all targets.

Comprehension on the concept of the label's depiction of efficiency was also low. Consumers associated efficiency to the stove technology with the capacity to contain heat and made reference to brands like 'Gyapa' which has a thick lining with the capacity for heat retention.

Comprehension on labelling texts was also very low. These were mostly not read by consumers especially the typical firewood and charcoal users who also had low levels of education but was however very informative to users who could read.

Relevance of performance labels

Labels were generally seen to be relevant to consumers in terms of providing product information and connoted a sense of approval from an authorised body in authenticating the validity of products. Although, consumers admit that label is relevant and crucial to purchase decisions, most consumers either do not read or are not able to read the content of labels. This is predominant across targets of various literacy levels. Thus, there seems to be a direct connection between level of education and the desire to read label content among consumers.

Key benefits as understood by consumers

Despite the varying level of comprehension of the label features, consumers were able to tell the benefits improved cookstoves will offer them. These were implied benefits laddered from the properties of improved stoves as they understood the features of stoves. The functional benefits are associated to the quality of the cookstoves and are related to the less fuel usage, the less smoky emission of gas and also less emission of heat. The health benefit is laddered from reduced exposure to smoke, effect on eyes, less heat on the body, etc. while the economic benefits had strong association with less fuel use leading to savings on fuel purchase. Safety did not have strong association but people think since it reduces the amount of fuel used coupled with the model of stove, it could be used in an enclosed space and it would still be safe.

Impact on purchase behaviour and attitude

The concept of performance label for biomass stove is a welcomed idea across stakeholders who feel it will promote the use of improved stoves. However, consumers are usually a bit sceptical about performance labels because of the influx of fake materials and inconsistency in adherence to regulations in the country. The performance label is not enough evidence to drive consumer purchase of a new product or new improved stove.

Potential increase of information on label design

The optimised label is simple and appeals to all targets. The potential increase in the amount of information on the label might not be necessary at this inception phase since the level of comprehension of label features is low. As the market matures and expands, any necessary increase in information must be done in a simple and stepwise manner.



5.2 **Recommendations**

Based on the findings of this study, the following recommendations are made to inform the finalisation, introduction and communication on the cookstove label:

- The level of comprehension and understanding of label features varied among targets. To increase comprehension levels and the reach of the cookstove labelling programme, the integration of specific target-tailored communication of label features and concepts across the different targets is recommended. The following key ideas should be communicated to curb the misconceptions associated with some of the design features:
 - o Raise and sustain knowledge campaigns on basics of energy efficiency, emissions, stars and other label features to address misconceptions about labels through the use of all available media platforms;
 - Consumer education should also focus on drawing the attention of consumers to the benefits of having cookstoves with performance labels on them.
- Efficiency and emissions were two concepts that had low levels of comprehension across targets. Much emphasis should be placed on these concepts in public education and in the development of communication tools.
- Given the relatively new and unexplored nature of cookstove performance labels on the Ghanaian market, a comprehensive communication campaign using much of a teaching approach to enhance association of features to communication rather than a story telling approach so consumers can associate features like rating of stars to efficiency, emissions approved to health benefits, etc. is recommended.
- The label design should be kept simple, straight forward and have a stepwise approach to introducing much more information as the market matures.
- Stringent enforcement and adherence to standards and labelling increases consumer confidence in products. EC must ensure strict enforcement of cookstove labels to ensure that all manufacturers have their products certified with this cookstove label before it comes on to the market.

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Glossary	
Black stars	National symbol representing Ghana as an African/Black race. Aligns with the black star in the Ghana national flag and consistent with stars used in existing appliance labels
	Message: The more the stars, the better the efficiency
Brand	Refers to product name (e.g. Gyapa, Cookmate, Toyola, Envirofit, etc.)
Colours used in the label	Represents the national colours of Ghana
Domestic stove	Relatively small sized stove used for cooking meals for a household
Emissions	A visible and invisible particles and gas released during the burning of biomass fuel which could be harmful if inhaled in large quantities. Of particular importance is the release of carbon monoxide (CO) and particulate matter ($PM_{2.5}$)
Flame & stove	Represents cooking fuel (firewood, charcoal, pellet, briquette, etc.) and the stove represent both domestic and institutional stove
Institutional stove	A stove designed to hold a pot size of 20 litres and above. Basically, a term used to describe a big sized stove used to heat or cook a meal for multitudes of people including food vendors, chop bars, hotels, schools, agro-processing, etc.
Model	Refers to size of stove as classified by manufacturer
National flag	Standard for Ghana
Particulate matter	Mixture of solid particles and liquid droplets released during the burning of biomass. $PM_{2.5}$ is particulate matter 2.5 micrometres or less in diameter. $PM_{2.5}$ is generally described as fine particles. An important component of $PM_{2.5}$ is black carbon (BC), the dark soot particles which have a major influence on global warming though a short lifetime in the atmosphere

Message: The lower the emissions, the better the stove. In relation to the threshold proposed for Ghana, PM₂₅ is 137 Mg/MJd. The higher the difference in the stove's emission compared with the threshold, the better and safer the stove Benefit: Cleaner cooking environment, healthy and more comfortable life especially for women and children Thermal/fuel/ energy efficiency Refers to how efficiently the stove burns a quantity of fuel to produce heat needed to boil or cook a meal Message: The higher the efficiency, the better the stove. Efficiency is represented by black stars. Hence, the more the stars, the better the efficiency Benefits: Economic/financial. The lesser the fuel used to perform a cooking event, the higher the savings made on cooking energy budget. This translates into more money in the pocket/purse

