GENDER EQUALITY AND SOCIAL INCLUSION (GESI) ANALYSIS AND ACTION PLAN FOR THE IMEU PROJECT

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Contents

List of Acronyms

ACE	African Clean Energy
CWEEL	Council on Women in Energy & Environmental Leadership
CSR	Corporate Social Responsibility
EE	Energy Efficiency
EEAU	Energy Efficiency Association of Uganda
GESI	Gender Equality and Social Inclusion
ID	Identification Card
IMEU	Inclusive Markets for Energy Efficiency in Uganda
LED	Lighting Emitting Diode
MEMD	Ministry of Energy and Mineral Development
MGLSD	Ministry of Gender Labour & Social Development
NUDIPU	National Union of Disabled persons of Uganda
PWDs	Persons with Disabilities
SME	Small and Medium Enterprises
STEM	Science, Technology, Engineering, and Mathematics
USSIA	Uganda Small Scale Industries Association
UTC	Uganda Technical College
UWEAL	Uganda Women Entrepreneurs Association Limited
UWEP	Uganda Women Entrepreneurship Programme
YLP	Youth Livelihood Programme

Executive Summary

The gender equality and social inclusion analysis (GESI) for the Inclusive Markets for Energy Efficiency in Uganda (IMEU) Project was conducted in October to November 2022 for SNV. Over its four years of implementation, IMEU will develop sustainable, inclusive markets for appropriate energy efficiency (EE) products and services for households, businesses, and institutions.

The GESI analysis covered three cities and three districts out of the project's operational area. Data was collected through key informant interviews (KIIs) supplemented by focus group discussions (FGDs) (at household level only) from 10 stakeholder groups including manufacturers, importers, and distributors; energy auditors; hotels/restaurants; schools; health centres; prisons; offices; households; women entrepreneurs and enablers (including industry associations, gender focal points and policy makers).

Gender based constraints of manufacturers, importers, and distributors

- Most suppliers are not deliberate about collecting data by gender, age or other forms of categorization in order to better understand and retailor the product to meet various client segment needs.
- None of the suppliers had a good understanding of PWD priorities for EE
- Youth participation as a client range from 5% to at most 30%; far below the proportion of youth in the general population mainly because of low access to resources but also because youth priorities – smart phones, energy solutions for powering enterprise and entertainment have not been fully integrated in current offers. PWD participation is even lower to non-existent with no products or institutional innovations targeted at enhancing their participation in EE markets.
- Untimely delivery of orders affects at least four of the 19 suppliers (largely men-owned companies) occasioned by several factors including small, manual dated equipment that can't be used to deliver huge orders in time, shipment delays, high transport costs that necessitate the need to first bulk orders by area before deliveries are made and lack of a distribution truck.

- Sales teams are dominated by men (70%) on average. Women tended to be stereotyped as "lesser" regarding sales performance in rural contexts.
- Suppliers combine promotional channels to assure inclusion. The high costs of promotion, however, prohibit their ability to use these at scale and reach everyone
- The opportunities for men, women and youth as owners, employees and service providers in EE value chains abound. The major hindrance to cultivating opportunity is, however, the limited access to operational capital more so in the aftermath of COVID-19
- Internal capacity for gender, youth and PWD mainstreaming is low is some areas including having a policy that guides engagement of youth, women and PWDs at various levels, a sexual harassment policy, infrastructure to cater for the specific needs of young women and PWDs e.g., childcare facilities, ramps for wheelchair access, etc.

Recommendations for addressing gender-based constraints and opportunities at supplier level

- Incorporate sex, age and PWD status disaggregation in needs assessment collection tools and analytical procedures
- Retailor products to account for women, youth and PWD's specific needs and interests
- Enhance participation through improved access to credit sales
- Develop EE packages to power youth-led enterprise
- Target corporate youth as anchor clients who purchase EE solutions for their parents domiciled in electricity under-served areas
- Enhance access to financing for process upgrades
- Establish quotas for women's engagement in fields where they are likely to be marginalised by stereotypes on appropriate jobs for women.
- Integrate promotion of supplier products and services in the project awareness campaigns on EE
- Enhance access to financing of nodes that employ women, youth and PWDs

- Facilitate NUDIPU to identify priorities and opportunities for engaging PWDs in EE value chains for use by suppliers
- Provide support through the MDF towards improvements in supplier capacity for gender and youth mainstreaming

Gender based constraints of users in EE value chains

- Outside lighting and clean cooking appliances, there is limited awareness on energy efficiency among potential users at all levels.
- Inadequate insulation of the wiring, limited use of protective gear and lack of automation affects women' and female youth's willingness to engage in on-job training opportunities for machine operators
- The job displacement effect is more likely for a switch to institutional cook stoves and or energy efficient motors that are integrated with automated processing lines. In the formal case, women are the ones most likely to lose a job because they are considered less versatile.
- Design was considered appropriate for all users except for a few instances where users identified anomalies that were affecting their satisfaction with the EE appliances
- Ability to pay was considered an issue by potential users of EE appliances including men, women, and youth.
- Autonomy in decision making regarding technology purchases was generally high although Managers and administrators, however, may need support with evidence to use in pitching the technology switch proposal to their bosses and or management committees.
- The jobs created at user level for technicians who install, repair and or maintain are likely going to male youth due to a structural bottleneck linked to low participation of girls in STEM education fields and the workplace stereotypes that limit the participation of qualified women in these fields.

Recommendations for addressing gender-based constraints and opportunities on the demand side

- Enhance awareness among users on energy efficiency using their preferred modes of access to information on technology advances
- Provide support to enhanced safety of processing operations to support women's entry at the operator node
- Require beneficiaries to update their recruitment policy with provisions for affirmative action for women in adverts and recruitment processes for machine operators
- Providers intending to switch to institutional cook stoves or automated lines should provide options for re-deployment of affected personnel
- Fund customer needs assessments and satisfaction surveys and subsequent product development to meet the needs of women, youth and PWDs
- SNV should engage banks to provide financing products for investments in EE appliances.
- Offer evidence on the benefits of switching to EE appliances to managers and administrators at various levels.
- Support suppliers to create demand for their products
- Require suppliers to offer opportunities for qualified women and or PWDs to participate as technicians on the teams that offer installation and maintenance services

1. Project Background

1.1 About the IMEU Project

The Inclusive Markets for Energy Efficiency in Uganda (IMEU) is a four-year project funded by the Embassy of Sweden (EoS) in Kampala, Uganda. IMEU is implemented by a consortium of 3 partners: SNV Netherlands Development Organisation (lead), College of Engineering, Design, Art, and Technology (CEDAT), and Private Sector Foundation Uganda (PSFU).

The project aims at developing sustainable, inclusive markets for appropriate energy efficiency (EE) products and services for households, businesses, and institutions. A sector development approach will be applied with 3 main components: (1) developing a socially inclusive ecosystem for energy efficiency (enabling environment), (2) targeted, contextualized support to small medium enterprises (SMEs) and energy service companies (ESCOs) (supply) and (3) stimulating uptake of EE products and services by increasing awareness among energy users (demand). The thematic scope for the proposed energy efficiency is agriculture (focus on agribusinesses and farmers' cooperatives) and built environment (focus on households, businesses, and institutions).

In agriculture, the project shall cover four value chains that include Tea in four districts (Buhweju, Kanungu, Kabarole, and Bushenyi), soybean and sunflower (Kole, Oyam, Dokolo and Lira), Maize in Metropolitan Kampala, and the named districts above that cover the other value chains. On the other hand, in the built environment, the project shall also cover three cities (Fort Portal, Kampala and Lira).

1.2 Objective of the Assignment

This assignment focused on conducting a gender equality and social inclusion analysis for four selected agricultural value chains (tea, maize, soybean and sunflower) in addition to the built environment (households, businesses and institutions) for the IMEU project.

The specific assignment objectives were to:

1. Identify the energy related gender issues in the four selected value chains and the built environment.
2. Develop a gender action plan clearly stipulating what needs to be done, by who, and/or with who regarding the gender issues identified.

1.3 Assignment Methodology

Field work for the study was undertaken between 4th October and 14th November 2022 using largely key informant interviews Across study cities and districts, the following interviews were conducted:

- 4 Focus group discussions with youth (male and female)
- 2 Focus group discussions with senior men
- 3 Focus group discussions with senior women
- 12 KIIs with relatively well to do households in Kampala and Fort Portal
- 18 Key informant interviews with school/college administrators (6 per city)
- 18 Key informant interviews with health facilitators (6 per city)
- 18 Key informant interviews with manufacturers, importers and distributors of improved cook stoves and energy products (6 per city)
- 24 Key informant interviews with owners and managers of maize mills (in Kanungu, Bushenyi, Fort Portal, Lira and Kampala Metropolitan)
- 6 Key informant interviews with owners and managers of sunflower oil mills
- 18 Key informant interviews with owners and managers of hotels (6 per city)
- 2 Key informant interviews with energy auditors
- 6 Key informant interviews with government officials and industry association leaders
- 17 Key informant interviews with women entrepreneurs (all cities)

In total, 138 key informant interviews and 9 FGDs were conducted across study areas using key informant guides and FGD guides respectively. A combination of purposive sampling and snowball techniques were used to select both key informant interviews and FGDs participants. Field data was audio recorded with consent from participants and transcribed afterwards. Qualitative data in form of field notes and transcription

of the interviews were analyzed using thematic analysis. Participants were also asked to score themselves using a Likert scale of 1-10 with 1 being least and ten, best. The purpose was to concretize with them regarding domains of least performance and to collectively identify strategies for closing the gap and moving towards 10. Any domain rated 7 and lower would be followed by a question on what they would be most motivated to do, or they thought others should do to close the gap. These actions have formed the basis for the recommendations proposed in the action plan.

2. Results of the GESI Analysis

2.1 Gender responsiveness of Manufacturers, Importers, and distributors of energy efficient appliances

In the energy efficient value chains targeted by the IMEU project, different services are delivered to its stakeholders (see Table 1 below).

Table 1: Services in the IMEU project energy efficient appliance value chains

Service availed	By Who	To Who
Improved cookstoves Institutional cookstoves Electric pressure cookers Solar powered cookers Induction cookers Gas cookers Electric cookers LED Lighting Solar lighting Solar water pumps Solar water heaters Solar refrigerator Energy efficient electric water heaters Energy efficient refrigerators and freezers Energy efficient air conditioners Energy efficient dryers Energy efficient motors	Manufacturers, Importers and distributors	SMEs, social institutions and households in the built environment

Credit	Financing providers	All
Energy audits	Energy auditors	-do-
Other services	Transporters, scrap metal dealers, electricians, etc.	-do-

We used the gender scan to analyse the gender-responsiveness of some of these services provided. The tool was directed at three categories of respondents – the Manufacturers, importers, distributors and their sales agents, energy auditors and financiers. The tool used looks at three dimensions of gender responsive service delivery – i) whether a service provider assesses the needs of clientele in a sex and or age segregated manner; ii) the extent to which actual delivery is tailored to respond to women, youth and PWD's needs and iii) the extent to which the provider has built capacity to engender a gender-responsive workplace environment and culture that caters to the needs of women and young suppliers, clients and employees.

In the section below, we focus on the gender responsiveness of manufacturers, importers, distributors and their sales agents. 19 respondents in this category with operations based in Kampala Metropolitan, Lira and Fort Portal were engaged using key informant interviews. This category supplies EE solutions ranging from improved cook stoves, solar powered LED lighting solutions that can be upgraded to power entertainment appliances, surveillance cameras, fridges and to charge phones, solar water pumps, solar water heaters, and inverter power backup systems. The study intended to use snow balling techniques to identify importers and distributors of energy efficient motors and driers; however, all those identified are domiciled in Nairobi or elsewhere and could not be reached to identify their Ugandan distributors for KIIs within the study timeframe.

2.1.1 Understanding the energy efficient appliance needs of men and women

Suppliers rated themselves 7 out of 10 on understanding their target customer by gender and age mainly because for most of them the data is currently, not collected or analysed in a sex and age disaggregated manner.

The target customer varies by EE solution. The first category, the suppliers of home solar systems, have a more diverse client portfolio with at least four or more client segments and high local presence. The institution-based client segment includes schools, health centres, churches, the corporate office and organised VSLA groups in electricity under-served areas. The institution-based client is attractive because it is easy to peg the repayment plan on their salary and the head of the institution (e.g. hospital administrator, head teacher or VSLA committee) can easily be deployed to act as a guarantor or payment collector to stem defaults. This approach also lowers the cost of distribution. The second segment is the rural household, mostly engaged through sales agents (staff or community based) with or without the support of NGOs. Two distributors were also cultivating the local market vendor as a unique market segment. A few suppliers in this category are also nurturing the young entrepreneur as a client segment by solving their energy requirements for setting up small businesses in rural areas with no electricity such as saloons, phone charging booths, entertainment centres (kibanda), bars, etc. Local presence is usually high, established through partnerships with distributors or own service centres managed by off-the-counter sales and field agents.

The second category of supplier, the improved cook stove (sigiri) manufacturer, considers every adult Ugandan as a potential customer and appears to have no defined client segments. They tend to wholesale to mostly hardware store owners but also general retail stores, use motorcycle riders as sales agents who earn commissions on each sale or to vend their product using mobile vans.

The third category, the suppliers of high-end EE cooking solutions[1] and other solar solutions such as water heaters, pumps, etc. plus the providers of energy auditing services mostly rely on NGO support driven sales in refugee settlements[2].

The walk-in-customer cuts across, however, most suppliers decry the high cost of promotions required to reach this category and are mostly relying on customer referrals to build this client segment in their portfolio.

Women dominate the market for home solar systems (70% and higher), especially those focused on lighting but also those that power small TVs or radios and can be used to charge phones. They also dominate the improved cook stove market. Transactions with women for these products tend to be concluded faster and the payment default is lower in comparison to men. Why is this so? Suppliers felt that women tend to spend more time in the household and hence appreciate improved lighting better, further, intra household dynamics relegate cooking and related decisions to women. Because of this, men often consult their wives first before purchasing an improved cook stove and hence the sale takes longer to conclude. Distributors shared experiences where cook stoves bought by a man have remained unused or have had to be returned because the wife refused to use it. At the manufacturer/retailer level for the improved cook stove market, women retailers with outlets in the city, order more stoves from wholesalers and more frequently than their male counterparts. In rural outlets however, order size and frequency don't appear to vary.

Men, however, dominate the market for bigger solar systems (80% and higher). The few women, often, heads of institutions who purchase these systems tend to come along with a man.

"*Sometimes as I explain to a woman client how the whole system functions, they will just stop me there and come back with a man and tell me to explain everything to*

[1] Apart from ECOCA East Africa, the study didn't include any other providers of solar powered cookers and doesn't cover induction cookers or electric pressure cookers.
[2] Excluding improved cook stoves (sigiri), the commercial market for these appliances is largely undeveloped.

the man, sometimes a technician, their husband – a man generally." – Distributor, Lira

Youth participation as a client, ranges from 5% to at most 30%; far below the youth proportion in the general population even for lighting and cooking solutions[3]. The youth was mostly described as a window shopper, indecisive and a hard sell even when targeted in awareness campaigns, with limited ability to pay. Suppliers, however, acknowledged that the youth is interested in a different product; often a smart phone or a solution that helps them start a business, both of which have not been fully integrated in their offer. One supplier has however identified an opportunity to target the corporate youth as an anchor customer.

"Based on data from last year, the age profile of our client ranges from 25 to 85 years with the youth mostly indicating that they were buying the African Clean Energy One (ACE One) for their parents." – Importer and distributor

Few suppliers have worked with PWDs, none had a product range targeted at meeting their needs and in one instance, a supplier felt they were too few and too dispersed in the general population to target unless they were working with an NGO to support their inclusion.

"In my entire client portfolio and years of marketing I have only encountered one or two customers who are disabled buying my products directly. I have no product range targeted at the disabled or current engagement with organized groups or NGOs focusing on the disabled in this business. But I once worked with an NGO who support vulnerable groups including the disabled. They had various groups. I supplied them and I gave them a lot of time to pay back. But honestly in my daily routine I have not encountered many." – Distributor

The retiree was also considered a good target for some solar products *"…the solar powered water pumps for irrigation is usually purchased by those who have retired and now want to venture into farming." – Importer and distributor*

[3] However, the youth who is getting married tends to make an easy sell for these items

Men and youth were described as the most challenging to sell to. For men, this is in part because the gender division of labour and their greater interface with public spaces makes these products a lower priority. However, men's greater command of resources implies that suppliers have to demonstrate the benefit of these appliances often through "cooking" demonstrations [for cook stoves] to win them over and make a sale. Youth's priorities appear to be elsewhere, but they are also challenged by limited access to resources with suppliers offering credit sales as a way of meeting this challenge although they are also described as having a higher propensity to default on a credit sale.

Only one importer and distributor reported conducting periodic surveys of customer needs coupled with obtaining detailed data from each customer. This data is analyzed by age and gender and has led to stove improvements in line with the needs expressed by the women who use them. One other stove manufacturer doesn't conduct any needs assessments waiting only to adjust whenever a product is recalled due to quality defaults. All others use various tools to obtain customer feedback, some of which may feed into an understanding of needs. Tools used include checklists, simple questionnaires, direct phone calls or through customer call centers, informal field visits while marketing, observing trends and customer feedback visits to inform improvements. The other 17 suppliers, however, are not deliberate about collecting data by gender, age, or other forms of categorization in order to better understand and tailor the product to meet various client segment needs. This may represent a missed opportunity for meeting the needs of men, women, and youth, enhancing customer brand loyalty and consequently sales. There is need to modify the tools to allow for gender and age disaggregation.

2.1.2 Placing EE appliances and services delivery in ways that reach women, youth and PWDs

Suppliers rated themselves 7/10 on this domain.

The **requirements for access** vary by supplier ranging from full cash payments especially for non-institutional clients and the ability to cover own transport costs.

In the absence of cash, some suppliers accept an initial down payment [as fixed by the supplier] on the product which is then given to the customer after fulfilling the credit payment terms or an initial down payment is made, and the product retained until the full payment is made. Credit sales are usually for a product range costing a specified minimum or higher and attract other requirements including submitting a national ID or its equivalent, an LCI letter or reference letter from a member of their community, signed agreement form and a guarantor, a phone number registered in the client's names, agreeing to a home visit, and identifying a next of kin who is a member of the household. For groups, suppliers need an approval from their executive and a background check by local leaders. Manufacturers also talked of a minimum order size that qualifies you as a retailer, a maximum credit limit, willingness to pay within a specified timeframe and the need for client patronage for credit sales.

Often the rules have to be met because they are not considered too stringent or exclusionary. The only flexibilities provided were for salary earners when remittances are delayed, VSLAs that have existed for long and have never had prior financial challenges and the neighbours to a factory for instance. Further, youth tend not to have a national ID or its equivalent and suppliers were accepting a guarantor's ID in lieu. The widespread spread use of credit allows the more resource constrained clientele groups such as women and youth to participate in EE markets.

Distances to stocking outlets for the furthest client range from 5Km and above. Most suppliers have mechanisms in place **to compensate for these distances**, a plus given women's mobility constraints and the exclusionary effect that would likely impose on the remotest client.

Mechanisms include own transport delivery for large orders, deliveries by taxi following mobile money payments, deploying field sales teams who take orders and deliver door to door, deploying technicians for installations and repairs, phone-based orders sometimes on toll free numbers, branches/service centres all over the country, rural based agents (itinerant or [4]small electric or hardware stores that stock EE

[4] These electronic shops or hardware stores are identified in towns and trading centers, coded, stocked and then monitored for stock movement and sales to lower the costs of distribution.

appliances or relay product orders to the service centres.). Only one supplier reported the use of an ICT application for creating a prospectus of each customer for payment monitoring purposes; apps are however not being used for order placement or other customer engagement functions.

Timeliness of order delivery doesn't appear to influence a specific gender, age group or other vulnerable groups of customers within the context of EE appliances and services. Untimely delivery however affects at least four of the 19 suppliers occasioned by several factors including small, manual dated equipment that can't be used to deliver huge orders in time, shipment delays, high transport costs that necessitate the need to first bulk orders by area before deliveries are made and lack of a distribution truck. These suppliers were mostly men owned companies (3) and a multi-national corporation. Conversely, seasonality also affects client order sizes

"Yes, we have a seasonality factor which counts a lot. When children are returning to school and during high holidays like Christmas, no one buys solar products." – Distributor, Lira

In certain communities, men may have high preferences for women in the private sphere often expressed as limited interface with men outside their familial networks. This in turn limits women's interactions with markets and heightens the need for gender-balanced sales teams to allow such women interact with markets through female sales agents. All suppliers use sales agents ranging from 1 to 20 per service centre with some also engaging community-based agents. **All suppliers also had at least one woman among their sales teams**. Sales teams are however dominated by men (70%) on average. Women tended to be stereotyped as "lesser" regarding sales performance in rural contexts.

Hidden costs refer to charges above the stated price that customers may not have fore knowledge of until they are committed to the transaction. Such costs may lock out the less cash privileged customer who is often a woman, a youth or remotely located household. These costs included transport costs to service outlets often when delivery is required urgently outside the planned route chart, charges on mobile money payments, installation fees and costs of transporting and feeding technicians.

None of the suppliers felt these costs were a deterrent to any potential client and most of them considered that they had adequately compensated for these.

Nearly all the suppliers (18/19) promote their offerings using a range of channels. These include social media marketing, SMS, websites, use of content in the local language, phone calls, public announcements in churches, markets, etc., radio jingles and talk shows, exhibitions, door to door promotions by sales teams, TV adverts, Bill boards, customer referrals, use of toll free numbers for inquiries, use of local distributors, promotional materials (brochures, T-shirts, caps, etc.), print media, and road shows in towns and trading centres. Most suppliers acknowledged that some channels were exclusionary especially for groups that don't own the medium used such as radios, TVs, smart phones, etc. or those who lack use capability due to illiteracy or time poverty and they hence tended to **combine channels to assure inclusion**. The high costs of promotion, however, prohibit their ability to use these at scale and reach everyone.

The **opportunities for men, women and youth as owners, employees and service providers abound** as field sales agents, community-based agents, customers who earn commissions or free hours of lighting for sales based on referrals, interns for sales talent identification, shop owners who act as agents and receive stock at discount rates, businesses running on EE systems, transporters including motorcycle and truck drivers, off-the-counter sales officers, packers, loaders and off-loaders, electricians for installations, repairs and maintenance. For local stove manufacture, opportunities also include those who fabricate the machines, scrap metal dealers, those who mould and bake the clay, those who mould the metal frames and who do the finishing, etc. Opportunities identified for PWDs included as final product assemblers and as part of off-the-counter sales teams. The major hindrance to cultivating opportunity was the limited access to operational capital in the aftermath of COVID-19. In some instances, women are limited from accessing EE products by their husbands leading to gender-based violence …

2.1.3 Assessing customer satisfaction

The rate for this domain was high (9/10). Most suppliers (18/19) have systems for monitoring and obtaining customer feedback ranging from informal to fully fledged

customer insights and relations/after sales departments and use of apps for client monitoring. Tracking customer satisfaction by gender and age is however not being done although some suppliers have analysts/M&E persons on board or outsourced whose job is to analyse the data and inform management on opportunities for product development and re-tailoring delivery. Emerging priorities for women include lighting solutions and cooking appliances that are fast, durable [including for the saucepans used], affordable and energy saving. Men and youth gravitate more towards entertainment solutions. None of the suppliers had a good understanding of PWD priorities except for one supplier who has in place sign language interpreters among the sales team and a ramp to enable wheelchair access to their service centre.

Customers submit complaints and grievances through WhatsApp groups, sales agents, suggestion boxes, toll-free numbers for calls to the service centre or direct walk-ins. Contacts are usually availed at the point of sale through flyers or business cards.

2.1.4 Internal organizational capacities

Suppliers rated themselves 7/10 on internal capacities for inclusive service delivery with a focus on women, youth and PWDs. 4/19 suppliers have a gender and CSR policy that explicitly supports the inclusion of women, youth and or PWDs as suppliers and or employees. Youth dominate at the various levels of employment for suppliers. Key reasons included their perfect match for the levels of energy required to deliver sales in the field, the high proportion of youth in the general population, limited absenteeism due to low family responsibilities, their ability to respond quickly to emergencies among others.

The inclusion of women, however, faces some level of stereotyping

"*Youth dominate because the nature of work is taxing. I am thinking of fewer women doing the field work, they are good for desk work and over the counter sales and cash management. It's a very tricky one, I am not just being biased. Women have a lot of personal issues; if they are married, just know that a number of family issues will take them away. Also, in terms of being aggressive at sales, the men still beat them. But I would employ them on the receiving end. Receiving cash, counter sales,*

following up on debts, record keeping, all the book work. I would also prefer to work with those who have established shops in trading centers, as agents they are very honest people. The losses are minimal. But this penetrating the community and looking for a customer, that is where their challenge is and because it requires a lot of energy ... I would balance out like that." – Distributor

"*The problem is the community phobia that maybe when you are a woman, you cannot climb on the roof top, maybe you cannot ride a motor bike…*" – female sales agent

One supplier indicated that they are deliberate about recruiting PWDs while another pointed to opportunities, they could assign them if they ever applied. However, most were sceptical about the ability to mitigate workplace risk for PWDs given the nature of their work. On the other hand, most suppliers apart from two stated that have in place a non-discrimination policy or affirmative policy or practice to encourage the recruitment of qualified women. Most suppliers consider their remuneration fair and non-discriminatory of women and youth, allowing for equal pay for equal or equivalent work. Nearly all suppliers (18 out of the 19 interviewed) offer work-life balance policies or practice including flexitime for nursing mothers, paternity and maternity leave and annual leave. 6 out of 19 suppliers provide a complaint mechanism in the event of psychological or sexual harassment. The offering of leadership training, mentorship, and networking opportunities for the professional development of women, young people and PWDs had a mixed reaction. Only one supplier had a full-fledged capacity building program in place with training offered weekly. A few others offer some training and or induction to staff while at least one was having challenges with bringing the sales team together in one place concurrently in addition to grappling with high staff turnover. The provision of facilities to acknowledge workplace diversity including separate toilets, childcare rooms and ramps for ease of wheelchair access was low. About half the suppliers recognize and put in place measures to mitigate risks employees face in the workplace to their health and safety (e.g., medical insurance, travel insurance, etc.).

About 4/19 suppliers have a budget for CSR that also focuses on supporting youth, women and or PWDs to participate in EE markets. A similar number was working with

NGOs that have programs working at the nexus of EE and gender, youth and or PWDs. None of the suppliers was actively engaged in government programs for women or youth such as UWEF and YLP although two had tried or were trying to gain a footing. Two of the suppliers require their partners to include women, youth and PWDs as their clients, suppliers, employees.

Table 2: Summary of key issues affecting the gender-responsiveness of the services of EE suppliers

Identified issues	**Recommendations for enhanced inclusion at supplier level**
Most suppliers are not deliberate about collecting data by gender, age or other forms of categorization in order to better understand and retailor the product to meet various client segment needs.	• Incorporate sex, age and PWD status disaggregation in needs assessment collection tools and analytical procedures • Retailor products to account for women, youth and PWD's specific needs and interests
Youth participation as a client range from 5% to at most 30%; far below the proportion of youth in the general population mainly because of low access to resources but also because youth priorities – smart phones, energy solutions for powering enterprise and entertainment have not been fully integrated in current offers	• Enhance participation through improved access to credit sales • Develop packages to power youth-led enterprise • Target corporate youth as anchor clients who purchase EE solutions for their parents domiciled in electricity under-served areas
Untimely delivery of orders affects at least four of the 19 suppliers (largely men-owned companies) occasioned by several factors including small, manual	• Enhance access to financing for process upgrades

dated equipment that can't be used to deliver huge orders in time, shipment delays, high transport costs that necessitate the need to first bulk orders by area before deliveries are made and lack of a distribution truck.	
Sales teams are however dominated by men (70%) on average. Women tended to be stereotyped as "lesser" regarding sales performance in rural contexts.	• Establish quotas for women's engagement in fields where they are likely to be marginalised by stereotypes on appropriate jobs for women.
Suppliers combine promotional channels to assure inclusion. The high costs of promotion, however, prohibit their ability to use these at scale and reach everyone	• Integrate promotion of supplier products and services in the project awareness campaigns on EE
The opportunities for men, women and youth as owners, employees and service providers in EE value chains abound. The major hindrance to cultivating opportunity is, however, the limited access to operational capital in the aftermath of COVID-19	• Enhance access to financing of nodes that employ women, youth and PWDs
None of the suppliers had a good understanding of PWD priorities for EE	• Facilitate NUDIPU to identify priorities and opportunities for engaging PWDs in EE value chains for use by suppliers
Internal capacity for gender, youth and PWD mainstreaming is low is some areas including having a policy that guides engagement of youth, women and PWDs at various levels, a sexual harassment policy, infrastructure to cater for the	• Provide support through the MDF towards improvements in supplier capacity for gender and youth mainstreaming

specific needs of young women and PWDs e.g., childcare facilities, ramps for wheel chair access, etc.	

2.2 The special case of energy auditors

Excluding some of the tea processing factories and one health center in Fort Portal, all other users were unfamiliar with the term "Energy Auditor" or the services they offer. The tea factories get a range of auditors through project support such as from GIZ, or government (MEMD), the certification bodies they subscribe too such as ISO 14001, etc., and in a few cases certified energy auditors like Solar Power. Key recommendations resolve around enhancing motor use efficiency, reducing the firewood requirements of the boilers, installing a solar system that can power the whole factory. The aspirations of those that have never been audited included a smoke free environment, reduced energy bills, ability to pump their own water, solar lighting to enable an early start on classes, etc.

Key informant interviews were held with four certified energy auditors (all women). The initial plan was to conduct six interviews (3 men and 3 women) but this wasn't possible because they were not available. The findings shared here are hence biased to the perspectives of women in this field and may hence not be fully representative of the industry.

2.3 Gender based constraints among users[5] of EE appliances and services in the built environment

2.3.1 Introduction

Within the built environment, the most frequently used energy efficient appliances are for cooking and to a smaller extent lighting. Diversity in use of energy appliances is high among hotels, health centers and offices, however none of the managers or administrators was certain that the electric powered appliances they were using were certified energy efficient appliances (water heaters[6], cooling systems and water pumps). We however, established that these systems are usually installed and maintained by the providers within the warranty period, following which a technician is outsourced or employed (often a man) to trouble shoot as need arises.

"…there is a maintenance technician (who is male) in charge of all the appliances here."

"…the technical assistant (male) was trained by the service provider to carry out such assignments."

"… the technical person who is a man, also does the maintenance and servicing."

This is a structural bottleneck linked to low participation of girls in Science, Technology, Engineering and Mathematics (STEM) education fields and the workplace stereotypes that limit the participation of qualified women in these fields. Our conclusion was that the project's best bet is to focus on the supply end – supporting suppliers to create demand for these three appliances but also requiring them to offer opportunities for qualified women and/or PWDs to participate as technicians on the teams that offer installation and maintenance services. The user end should focus on

[5] Our study was a bit limited in the sense that we could not identify apriori who had shifted to EE appliances and consequently target them for a key informant perspective of the social impact of shifting to energy efficient appliances. We consequently identified key informants on the go, costing us a bit of time in the process.
6 In two instances, hotels in Fort Portal had shifted to solar water heaters but the installed systems had failed to deliver hot water 24/7 and the batteries malfunctioned within two years forcing them to revert back to electricity. Three health centers also in Fort Portal also reported a similar challenge with the unreliability of solar water heaters

increasing awareness about energy efficient water heaters, pumps, and cooling systems; offering energy audit services to demonstrate the value of switching and requiring beneficiary users to provide affirmative action for women, youth and PWDs when recruiting maintenance technicians.

Our discussion hence focuses on the nexus of social inclusion and use of EE cooking appliances (improved cook stoves, institutional cook stoves and gas-powered appliances.[7]) We didn't come across any users of induction cookers or solar powered cookers at household or institutional level. For brevity, we combine the perspectives of users at household and institutional level because there were no significant differences in lived experiences at these two levels.

At the level of the agricultural value chains targeted by the project, we didn't find more than three incidences each of purchase and use of energy efficient motors among the sunflower, maize millers, and tea processors we interviewed. Nearly every tea processor either had plans to install a new line, was in the process of installing one, was setting up a new factory, was in discussions with GIZ over the conduct of an energy audit or was sourcing for a supplier to install a solar electricity hybrid to solve their energy needs. General Managers or their production managers/engineers were, however, not always sure that the new lines they had just installed or were in the process of procuring were powered by energy efficient motors especially because they were still using the old lines alongside the new or the results of energy audits had not yet been shared by GIZ. Power outages also complicate their assessments on energy performance because they have to rely on generators in addition to UMEME. A user is hence delimited as one who experienced a significant reduction in the energy bill upon purchase of a new line (motors inclusive) or just a motor by itself. Again, for brevity and because users are few, we combine the perspectives of tea processors, sunflower processors, and maize millers on the impact on social inclusion of switching to EE motors (or more broadly an energy efficient processing line).

[7] This was included because it is the most commonly used appliance among hotels.

2.3.2 Awareness on energy efficiency among users

Most people have some context on energy efficiency especially in relation to lighting, cooking, and reducing GHG emissions. Among both users and non-users, awareness on energy efficiency was derived from various sources including promotions by providers in person or radio, TV adverts, etc., MEMD, the Uganda Tea Association, workshops and trainings by NGOs working in the energy sector such as SNV, knowledgeable friends, a directive from a government agency (e.g. one media outlet was directed by UCC to have EE air conditioners installed in the office and studios), social media and newspapers. Preferred sources that the users themselves frequent include WhatsApp forums and benchmarking visits with others in the same profession or line of business, newspapers, own searches on engines e.g., Google, SMS, and phone calls.

2.3.2.1 Effect of using EE appliances on workload and time use

Users rated energy efficient appliances 8/10 in terms of enhancing inclusive participation, reducing drudgery for related activities, and enhancing time use among other benefits. The section below looks at this in a bit more detail.

(a) How do men, women, youth and PWDs engage with energy efficient appliances as users, operators and or maintenance providers?

Working in the catering service is open to both men and women across hotels, schools, offices and health centers. When numbers go up [such as schools with high student enrollment, hotels and restaurants catering for large event orders, etc.) then men tend to dominate the cooking opportunities while women are more likely to be engaged to cook for staff or walk-in-guests. Schools explained that it becomes hard for women to mingle posho for huge numbers or to carry the size of saucepans involved. Discussions indicate that the proportion of women on a catering team is inversely proportional to the size of catering orders.

Age group doesn't seem to be a deterrent to entry and retention in the cooking department in institutions apart from at hotel level. First, women's retention is higher when they are still young and single with many resigning after marriage due to the unconventional hours although most hotels tend to use shifts to allow for work-life

balance. A typical day begins at 5 am and ends at 4 pm however, on days when hotels have events these hours can stretch into the wee hours of the morning. Secondly, age group of this cohort is often correlated with that of the Manager. In at least two instances, young managers indicated that they prefer working with youthful Chefs because they consider them send able and teachable.

Within households, the cooking appliances (improved cook stoves and or gas-powered stoves) are mainly used by women. The exception was the young men in Lira FGDs who indicated that they also actively engage in cooking especially when they are single, or their wives are engaged elsewhere.

Machine handling including managing the motors in maize mills is a preserve of men when you exclude the female proprietors[8] of maize mill enterprises. There is usually just one operator although numbers may go up to four during peak milling season when you include the mill owners. The operators start the motors, monitor their performance, and reserve a day for servicing (changing the bearings, oiling, etc.) The operators are usually selected by owners based on passion and interest and then trained on the job but women were described as nervous around maize milling machinery and unwilling to undertake training to become operators. One maize mill owner stated that the lack of insulation of the wiring, limited use of protective gear and lack of automation feeds this nervousness, keeping women from joining the node as operators in maize mills. In a few operations however, grain cleaning is mechanized and powered by motors with women in charge of the processes. This scenario is similar for sunflower operators.

In the tea processing facilities, the new lines with energy efficient motors are operated remotely by trained engineers and technicians. The highest number encountered was up to 24 technocrats, two of who were ladies. Each line is however run by at least an additional eight operators who sort, pack, and dispatch the tea with men and women participating in a ratio of 2:1 or lower. The majority tend to be youth whose highest qualification is usually an O-Level certificate. They get trained

[8] None of the female proprietors had bought energy efficient motors although they all knew how to operate their motors and other machinery. We didn't find any female owners among the sunflower and tea processing SMEs. However, some tea processing firms are cooperatives with a female membership of about 30%.

on the job since Uganda has no institutions offering courses in tea processing. The new lines offer no opportunities for PWDs because it is considered a risky work environment for them. Most tea factories have 3-4 PWDs following advocacy efforts by NUDIPU but they are engaged in what are considered safer spaces usually in administration, sampling, branding, weighing and manual packing units. Women are *also largely found in the withering and sorting sections.*

"…20 personnel work on the machinery, 12 are youth and only one is a woman."

"…We have 24 personnel in the engineering department and 2 of these are women, some of them are youth…"

"…women are tricky, they are very few who study these things and those who do don't want to work upcountry. We are recruiting a mechanic in relation to fabrication and fitting, and an electrician but … the few ladies who applied did not have the minimum qualification we required. It's a structural challenge. We also have opportunities for the disabled, but we don't have any that have applied so far. …For now, we don't add any affirmative action statements in the adverts." – Harriet, HR

(b) How do men, women, and youth benefit from a switch to more energy efficient appliances?

Lighting

The solar powered LED lights enable businesses stay operational even when there is load shedding. Most households, however, lack the capacity to install systems that meet their needs as someone attested.

"When we use it in the night for example to power the TV set, the lights will automatically go off. You have to choose between the lights and watching television which is an inconvenience to the household users." – Household, Fort Portal

"… the solar system can't perform other tasks like powering a TV set or even aid in entertainment (playing music on speakers). It is limited in the load it can power."

Cooking

The benefits of energy efficient cooking devices include time savings (from ease of lighting the fuel to time taken to turn around a meal for a client). School administrators also attested that now that the cooks no longer have to monitor and keep feeding in the firewood or charcoal or to check on the water levels, they can now use the time to interact with other staff and get ideas for personal development. The time savings also manifest as more satisfied customers and contribute to client patronage. Other benefits include reduced workload, lower to no smoke levels when a chimney is added, regulated heat levels, and hence improved health for workers but also firewood smoke free meals which are tastier. Hotels and school administrators also testified that hygiene around the kitchens had improved. The appliances also have less fuel requirements leading to energy cost savings.

"the built cook stove has reduced on the consumption of the charcoal. We buy in bulk; in a week we buy up to six bags of charcoal. The usage depends on the number of workshops we have in a week. On average in a week when we are very busy, if we buy up to six bags, we can use up to 4 bags. Previously before installing the energy saving cook stoves, we would buy like nine to ten bags for the same level of clientele." – Lira Hotel Manager

"…we would order 16 trips of firewood and it was very costly, …now a truck is 1,200,000 at the moment, but the trips have now come down to 8 per term" – School administrator

"… I remember those days to cook a pot of beans, I needed to use like 4 big firewood to get ready, but right now, … even three pieces, not even a whole thing, but it is just a piece, and it doesn't take much time now…" – Female Youth, FGD, Lira

Furthermore, accidents arising from a cook or child stepping on a log and causing the food to capsize on them or oil getting into contact with fire from the wood were eliminated. The traditional cook stove poses many risks to the poor as attested by this young man.

"…majority of us here live in grass thatched houses, one day this thing [the three stone stove] burnt my house down. I lost all my properties, all, and my child fainted, almost died." – Young man, Teso bar, Lira

The institutional cook stoves are however not completely smoke free and contravene the guidelines for a clean city especially for institutions domiciled in the city center. This has forced some hotels to prepare by switching to gas however this comes with a higher energy bill[9], moreover gas-powered appliances are limited in the types of food that can be prepared using them (i.e. can't do roasts, or foods that need to simmer for long or even huge events due to the size of appliances).

Cooling

Three major benefits arose from the discussions on the benefits derived by users by switching to energy efficient cooling systems specifically, the solar fridge and air conditioners. Health centers especially considered that the technology is user friendly, no additional training is required by all categories of staff that need to use it. It also gives the management and staff comfort and assurance that the fridge is on and preserving the vaccines, medicines and samples which wouldn't be case when using only electricity. A complete switch to solar even eliminates the need to spend on power tariffs or to put off work to a later time due to power outages. For media outlets, the big benefit was properly functioning gadgets (especially those that need cool temperatures) but also the improved ambiance for staff and clients leading to repeat clientele compared to before the installation of the technology especially in the presentation office.

Processors

The benefits to processors include faster processing times, lower energy bills, lower personnel requirements, a less noisy environment, improved work life balance for staff but also improvements on the product as these managers shared:

[9] Hotels however, had mixed reactions on this with a few thinking that it had actually lowered their energy bill overall. A good energy audit with a few hotels might be useful in this regard. Most households also perceive that a complete switch to gas increases the energy bill

"The benefits of the new line are many, …the old lines had the conventional troughs and were taking up too much space, the new line is designed to take smaller space. It processes the green leaf faster. It is automated, and so personnel requirements and costs are lower, and it doesn't beg for too much of the human hand. We think the energy bill has gone down, but we still have two old lines operating concurrently so only an energy audit can confirm that. Then it also produces tea with a great flavor… the cup taste – what you feel when you put it in your mouth…" General Manager, Kayonza Growers' Tea Factory, Kanungu

"First it is faster, I used to mill 20 tons in 24 hours with the old one but when this one came in 12 hours, I have already milled my 20 tonnes. I am doing the same in half the time… before my bill used to be 12 million when I have worked a lot – 12, 11, 10 million with the 50HP old motor. …I have checked, now during the times when I have worked a lot the highest, I have paid 7.5 million". – Managing Director, Bulshale Millers, Lira

"Before I got this knowledge, I was paying a lot of money and they were almost closing me down until I changed the motors and learnt how to regulate the speed to keep the bearings from wearing out".

"… those that are working in the factory now work for less hours, then they are able to relax or meet their families and yet they have completed the day's task…"

"… first of all, the amount of sunflower bring processed is higher than before, … it has reduced the workload, but also the bill for electricity has also gone down considerably, …" General Manager, Mt. Meru

"We anticipate better quality, …when a motor is moving faster, the rate at which it sucks air is higher and it is that air that pushes the flour, it is well aerated and so the final product will be a higher quality fine flour. The downside is that the high speed and the non-use of food grade material during fabrication is likely to lead to more metal in the flour. That is why if we are going to shift to more energy efficient motors, we also need to start looking at access to food grade material for fabrication, improved materials for the rest of the machinery, it is a combination." – Moses Opolot, Miller, Lira

(c) Do EE appliances lead to fair distribution of work between men and women; youth and seniors, PWDs and how?

A shift to energy efficient motors appears to improve prospects for women in terms of opening up opportunities to harness jobs where they are missing but only if the motors are powering an automated processing line.

"We still use women to dry and clean the grain outside the processing facility because they do that very well but from the moment the grain enters the processing section everything is automated, then we have both men and women working together…" – GM, Mt. Meru

Outside automation, traditional job segmentation by gender at processor level would persist because of the manual energy requirements of operating the mills.

A switch to clean cooking appliances may, however, have an effect on enhancing participation of men in cooking at household level, although this may not be widespread

"Personally, you know men fear smoke, that is what they fear most that is why they don't like cooking, but with the improved stove, you just can't imagine my brother waking up in the morning and telling me today I will do the cooking, … so I think it has really brought a positive impact…" – Young woman, FGD, Lira

In tea processing factories, the new automated lines have higher ICT requirements and could potentially lead to a preference for the more ICT savvy employee

"…Well perhaps if we switched all our old lines, it might replace the more senior cohort with youth, because it needs people with good knowledge of computer because much of it is automated, but we are not about to that..." – GM, Kayonza Growers' Tea Factory.

(d) Do work conditions for men, women and youth worsen in anyway when households, institutions and SMEs switch to more energy efficient appliances and are mitigation measures in place?

Discussions across users indicate that conditions of work that would affect the personal health and safety of workers do not worsen upon switching to the energy efficient appliances prioritized by the project. We were not able to establish a single instance in which a user's condition or their workload worsened. This statement however, changes in certain scenarios, for instance if you are talking about a processing line in its entirety rather than just the motors themselves. Processors, however, attempt to mitigate related risks to workers through training on safety and application of protective gear.

"… we do training on a daily basis, and the technocrats are always on the ground to make sure they teach our operators about machine regimes, guarding themselves, how to protect the machines and making sure they get and use the right protectives." – Head of Engineering, Rusekere Tea Growers' Factory

Compliance in terms of workers wearing the gear at all times was, however, not always a given.

2.3.2.2 Effect of using EE appliances on income and job creation for women, youth and PWDs

The income and employment effect of the EE appliances was rated 6/10 with most users indicating that the job creation effect is low.

a) Additional income generation

For most users, the income creation effect is largely derived from the reduction in the energy bill (cost savings) and the possibility of faster processing and hence higher volumes for sale, assuming additional raw material and market outlets are available. In the case of hotels, faster cooking allows for happier clients and the possibility of customer referrals and continued patronage that can lead to additional revenue.

As noted by tea and sunflower processors, a shift to a new line also leads to a reduction in personnel requirements (cost savings). This same effect also applies to clean institutional cook stoves.

"… in the kitchen we had 5 people, now only 2 people work in the kitchen after the introduction of those stoves"

The shift to EE appliances may, however, not necessarily lead to diversification into new revenue streams. Maize millers indicate that diversifying motor use outside the facility during the low season is impossible because KVA lines are not found everywhere in addition to other technical complexities. However, internal diversification is possible e.g., by crushing rather than milling the maize to make broken maize for feed suppliers or using the same machinery to produce fortified flours (a value-added product that would bring in more revenue). Conversely, tea production is a year-round activity with only room for maintenance breaks, so diversification is not tenable.

b) Job creation and or displacement

The direct job creation or displacement effect of the switch among users is considered low. In terms of jobs that can be directly linked to adopting use of the EE appliances; users may employ or outsource technicians to undertake installations, repairs, and maintenance for the range of EE appliances. This is expected to increase as more users adopt the use of EE appliances. The biggest beneficiaries are expected to be male youth.

Most EE appliances only lead to improved energy efficiency with no displacement effect on those employed to use them. There were, however, some actual incidences of job loss reported for institutional cook stoves and motors that are purchased alongside automated processing lines. For instance, some schools halved the number of cooks after switching to the institutional cook stoves with women more likely to lose jobs because they were considered less versatile compared to their male counterparts, i.e., incapable of mingling the posho for their student populations. One maize miller also stated that when they switched to a new processing line with energy efficient motors it came along with conduits that directly ferry the maize brand to the stores. The two men who had been ferrying the brand using wheelbarrows consequently lost their jobs. None of those who faced redundancies had the capacity to redeploy the affected workers internally.

2.3.2.3 Design appropriateness of EE appliances to allow for use by all categories of users

Most EE appliances were considered well designed and customizable for use to suit all types of users [except for the case of PWDs]. There were some concerns, nevertheless. For institutional cook stoves, the height tends to favor men especially when mingling posho; administrators also wanted provisions for smaller saucepans to allow for use during the holiday seasons when only staff need to be served. For improved cook stoves for the home, and solar equipment durability was considered the biggest challenge. Whereas with saw dust powered cook stoves, the high energy requirements were considered too wasteful (one user reported that one bag of saw dust is needed to cook a meal of beans!). Improved cook stoves for the home were also considered too heavy. Households suggested that home solar appliances that include charging ports should allow for more ports to allow them start phone charging as a business. Hotels expressed challenges with the size of gas appliances as most don't make provisions for huge saucepans which forces them to revert to charcoal when hosting large events and workshops. Additional research on the possibilities for roasting and simmering options and reducing the weight of cylinders would also be needed. The reliability of solar water heaters at hotel and hospitals was also a major concern for those that had shifted.

2.3.2.4 Acceptability of EE appliances

Across the different cultures sampled (the Langi, Batooro, Banyankore and multiethnic Kampala) the study didn't register any norms or values that would be contravened by switching to energy efficient appliances. There is a widespread belief that gas poses high safety risks but mostly by households with children. EE appliances were hence rated 10/10 on cultural acceptance.

2.3.2.5 Training

All owners of EE appliances (apart from the improved sigiri for households) reported receiving training or at least an instruction manual on technical aspects upon purchase and installation. In one instance, operators were trained for a year by the

provider to skill them in also making the spare parts which they now fabricate at UTC Lira as needed.

In the processing SMEs, training is usually targeted at machine operators and hence often it is men that are trained except in some tea processing factories where women are also employed as operators. Trainings are considered conveniently timed and located for all users because they happen in the workplace during working hours. Women often participate as trainers depending on the EE appliance in question. Training on business development is however, not yet undertaken.

2.3.2.6 Affordability

Nearly all those that have purchased at least one EE appliance were highly motivated to make the purchase; usually by a need to lower the energy bill. Affordability was, however, an issue for some and the following suggestions for enhancing affordability were made:

- Financing providers should develop products with manageable conditions to finance technology upgrades as shared by this Miller

"Loans are available, however, most of the Millers here are renting. They are not landowners but the banks want titles. Where will that person get a land title from? But they can pay ground rent and lease a machine of 50 million, but they cannot buy land of 100 million. The conditions are a little bit stringent for us. All borrowing requires security which is usually a land title, but sometimes you can offer alternatives like moveable securities like a vehicle logbook, a land sales agreement. But this means you will get less money. But if you have a land title, you can access more money to do what you want." - Miller, Lira

- Providers should accept instalment payments or 'pay as you go' options
- Government should waive taxes on machinery
- Government should provide subsidies on raw materials
- Government should empower technical colleges like UTC Lira to fabricate the motors
- Government should deal with counterfeits on the market
- Providers should raise awareness on the benefits of EE appliances

- Conduct cost benefit analyses and make them available to users to aid in decision making
- Providers should manufacture a size for every pocket
- Providers should offer discounts
- Providers should use innovative manufacturing methods and low-cost materials to reduce costs to the end user
- Establish model villages in communities where users can be enlightened about EE technology
- Users especially institutions should lobby for grants from donors for technology upgrades.

2.3.2.7 Accessibility to EE appliances

Accessibility was given a rating of only 4/10

The major condition for access was cash since some providers don't offer credit sales. For specific appliances such as institutional cook stoves, the materials for construction have to be availed. While for machinery, providers often need a machine operator to give the instructions too and detailed specifications. The most challenging barrier to access was considered the cash payment.

If physical proximity is lacking it is often compensated for using various mechanisms including use of mobile vans, agents, etc. Most users, however, prefer that outlets are brought closer to all major cities.

2.3.2.8 Access to after sales services

Basing on just the perspectives of those that have purchased EE appliances, after sales services are generally availed to varying degrees. The service package may include a warranty, a retention policy, an onsite technician or performance checks and repair/maintenance services during the warranty period, access to spare parts, etc. Providers generally treat smaller establishments just as well as they do big business.

2.3.2.9 Autonomy in decision making

This domain was rated 7/10 on average. Most business owners have a high level of influence on purchase decisions. Managers and administrators, however, may need support with evidence to use in pitching the technology switch proposal to their bosses and or management committees.

Table 3: Summary of the gender-based constraints of users of EE appliances

Identified issues	Recommendations for enhanced inclusion at user level
Outside lighting and clean cooking appliances, there is limited awareness on energy efficiency among potential users at all levels.	• Enhance awareness among users on energy efficiency using their preferred modes of access to information on technology advances
Inadequate insulation of the wiring, limited use of protective gear and lack of automation affects women' and female youth's willingness to engage in on-job training opportunities for machine operators	• Provide support to enhanced safety of processing operations to support women's entry at the operator node[10] • Require beneficiaries to update their recruitment policy with provisions for affirmative action for women in adverts and recruitment processes for machine operators
The job displacement effect is more likely for a switch to institutional cook stoves and or energy efficient motors that are integrated with automated processing lines. In the formal case, women are the ones most likely to lose a job because they are considered less versatile especially	• Providers intending to switch to institutional cook stoves or automated lines should provide options for re-deployment of affected personnel

[10] Most Millers indicate that they now mill in the off peak window of midnight to 6am which is likely to made this node even less attractive to women.

Design was considered appropriate for all users except for a few instances where users identified anomalies that were affecting their satisfaction with the EE appliances	• Fund customer needs assessments and satisfaction surveys and subsequent product development to meet the needs of women, youth and PWDs
Ability to pay was considered an issue by potential users of EE appliances including men, women, and youth.	• SNV should engage banks to provide financing products for investments in EE appliances.
Managers and administrators, however, may need support with evidence to use in pitching the technology switch proposal to their bosses and or management committees.	• Offer evidence on the benefits of switching to EE appliances to managers and administrators at various levels.
The jobs created at user level for technicians who install, repair and or maintain are likely going to male youth due to a structural bottleneck linked to low participation of girls in STEM education fields and the workplace stereotypes that limit the participation of qualified women in these fields.	• Support suppliers to create demand for their products • Require suppliers to offer opportunities for qualified women and or PWDs to participate as technicians on the teams that offer installation and maintenance services

2.4 The gender-based constraints of women entrepreneurs in the EE sector

KIIs were held with 17 women entrepreneurs identified using snow-balling techniques among both users and suppliers. A good proportion of those interviewed were female youth. The 5-M looks at five factors that are important for promoting entrepreneurship i.e., Management, Market Conditions, Money, the Macro-Meso environment representing the different norms, rules and regulations that hinder or support entrepreneurs and Motherhood (how women navigate childcare and work

responsibilities to ensure work-life balance. A checklist was used with women entrepreneurs covering the 5-Ms to understand which were the most constraining, why and the solutions they proposed. These 5Ms are all interconnected. E.g., the gender bias in inheritance laws and land ownership ('Meso-Macro') limits access to finance ('Money'). Social norms that limit women to travel as freely as men ('Motherhood') influence their access to more far-away markets. As a result, they often focus on less remunerative, nearby markets ('Market Conditions'). The results of the 5-M model tool are discussed below:

2.4.1 Access to systems and tools for business management

Most women entrepreneurs had a clear vision for their business in the next five years, however, only two had a written business plan with clear steps indicating how this vision was to be realized. Advice for writing business plans is mainly obtained from their husbands and friends but also search engines, women entrepreneurship forums or by outsourcing a business consultant. Two of the women also consider their sources of information for business to be highly satisfactory.

All the women have role models but only four had an active mentor in their line of business. Memberships in groups that give them a shared sense of identity is low with only four women participating in such groups although none are registered formally. Also, only four belong to a professional network that gives them access to business contacts and information as needed. Only one-woman entrepreneur felt they had adequate management tools and skills; for the rest the key areas of improvement included ICT use e.g., for record management, personnel management, reducing defaults, marketing, and finance management. Apart from one, all other women felt comfortable with leading their teams. All the women are actively mentoring other women through their businesses. Most women are also comfortable with voice especially in showcasing their businesses but not to protest mistreatment by authorities. Most women also felt they didn't have the capacity to manage stress in overwhelming situations. Management was rated 6/10.

2.4.2 Access to markets

This area was also rated 6/10. All the women entrepreneurs were clear on their target market. Most women reported facing challenges with marketing in part due to low demand derived from the economic downturn but also specific reasons such as lack of UNBS certification for those selling products yet certain markets such as some schools demand it, limited diversity, and business acumen among directors, etc. Areas for product improvement to get better markets included diversifying the product offer, support towards developing a marketing strategy and training in use of e-marketing tools.

2.4.3 Access to money

Women expressed having limited access to information on financing tailored to meet women's needs and interests or to a financing advisor. Financing in general was rated only 4/10. The constraints women face in financing vary as shown below

"Sometimes, the Bank tells you have don't have a man, you are not getting the money, if you are not married, you don't get the amount you have requested for, so they reduce."

"…the conditions... UDB may target a loan product of a 100M minimum for women at 8% interest, but then say for you to qualify your capital should not exceed 20 million!"

"Property valuation is not standardized …"

"… there was a capitation grant for schools after COVID, guess what if your turnover was above 50 million a year, you wouldn't qualify!"

"… with Uganda Development Bank, they gave us a grant, but ...they tied the grant to a loan which was disbursed in instalments for a period of two years."

"The time for processing a loan from the bank is too long sometimes, the banks need to improve on that, sometimes they take two or three weeks"

2.4.4 Macro environment for women in business

This was rated 6/10 on average. Social expectations placed on women in business were not considered to be a hindrance to progressing in the business. However, pointed to high taxation requirements including the range of taxes but also the increments made on taxes in the recent past as a greater hindrance to their businesses.

2.4.5 Motherhood – balancing work and life

This domain was rated 8/10. Overall, women entrepreneurs considered their businesses as easy to combine with their family responsibilities and their husbands as largely supportive of what they do. Opportunities for enhancing work-life balance included

- Learning to say NO
- Delegating more including building client confidence in their co-workers
- Obtaining a helper at home and a manager for their businesses

Table 3: Summary of the gender-based constraints of women entrepreneurs

Identified issues	Recommendations for enhanced inclusion at supplier level
Most women expressed inadequacy in management tools and skills especially in the areas of ICT use e.g., for record management, personnel management, reducing payment defaults, marketing, stress, and finance management.	• Support business management training for women entrepreneurs • Provide networking and mentorship opportunities
Most women expressed challenges with marketing their service or product offering	• support towards development of marketing strategy and training in use of e-marketing tools.

2.5 Gender actors in EE value chains

Gender actors in the enabling environment were mainly identified through KIIs with industry association leaders including USSIA, EEAU, etc. A brief discussion of each is given below:

Ministry of Gender Labour & Social Development (MGLSD)

The mandate of the ministry is to empower citizens to maximize their individual and collective potential by developing skills, increasing labour productivity, and cultural enrichment to achieve sustainable and gender sensitive development. It is comprised of the following administrative directorates: Labour, Employment and Occupational Safety; Social Protection; and Gender & Community Development which promote issues of social protection, gender equality, equity, human rights, culture, decent work conditions and empowerment for different groups such as women, children, the unemployed youth, internally displaced persons, the older persons, and persons with disabilities.

In respect to IMEU, the Ministry fulfils its mandate through the effective operation of the respective City Councils (Kampala City Council Authority (KCCA), Lira City Council and Fort Portal City Council) and the select District Local Governments under their Community-Based Services Department (CBSD) in the management of social risks and opportunities at the nexus of gender, youth, PWDs and energy. The staff who deal with PWD, gender and youth affairs are the community development officers, the probation and welfare officers and the labour officers. However, the District CBSDs are generally under-resourced in terms of human, financial and logistical resources that adequate resources would need to be earmarked specifically to aid their engagement. These departments also oversee the implementation of the government funded Youth Livelihood Program (YLP), the Uganda Women Entrepreneurship Program (UWEP) which provides opportunities to the project for leverage and building synergies.

The **Ministry of Energy and Mineral Development (MEMD)** launched its gender strategy on 18th November 2022. MEMD boasts a fully-fledged Gender Unit, a Gender Focal Point Officer (GFP) and the Interdepartmental Gender Mainstreaming Committee (GMC). The GMC ensures:

- the mainstreaming of gender in policymaking, planning and the implementation of projects, e.g., electricity construction projects.
- support for the supervision of projects to track gender equality actions; and
- the gender sensitization of ministry staff, project executing companies and communities in all project-intervention areas.

The **Equal Opportunities Commission (EOC)** assesses the level of allocation of financial resources allocated to gender and equity actions in the energy sector using the Public Finance Management Act (2015).

Council for Women in Energy and Environmental Leadership (CWEEL) Uganda Chapter is a division of the Energy Efficiency Association of Uganda. CWEEL's mission is to support career development for professional women, mentoring, networking, and scholarships for aspiring women to pursue technical education and careers in the energy and environmental fields. The Uganda Chapter in particular seeks to:

- Encourage women to overcome the challenges of working in a predominantly male workforce, evoking change, improving work/life balance conditions, and increasing diversity in the workplace.
- Secure a future in energy and environmental-related technical fields for women by supporting the training, education, and mentoring of young girls and women.
- Contribute to the advancement of women in leadership positions throughout the industry.
- Support the development of a more prominent voice for women in the industry.

Women of Vision

The Women of Vision registered as Fort-Portal Women of Vision Group Ltd is a consortium that brings together the women entrepreneurs of Fort Portal. The

consortium has a well-established governance structure and current activities include savings, advocacy, and shared learning.

United Nations Entity for Gender Equality and the Empowerment of Women (UN Women)

UN Women positions as a strategic partner to governments including Uganda to contribute to the advancement of Gender Equality and Women's Empowerment (GEWE) in the country. UN Women has provided support to various efforts in the energy sector including regarding development of the gender equity compact for Uganda's energy sector. Two of its programmes are of direct relevance to IMEU:

Women have increased productivity, income, and access to resources- This programme focuses on providing technical, financial and opportunities for business development targeting women emerging entrepreneurs to own, manage and benefit from small medium and large enterprises in a profitable and sustainable manner.

Vulnerable women have the capacity to mitigate and adapt to climate change and disaster reductions- this programme focuses on strengthening the capacity of government institutions and non-state actors to promote climate-smart agricultural interventions which enable more women to have access to and use modern, renewable and affordable energy sources, technology and services, and champion women's increased participation and leadership in climate action at all levels, including in gender-responsive green and blue economies and climate-resilient agriculture.

3. Annexes

List of interviewees