



SURVEY ON EFFICIENT AND PRODUCTIVE USE OF ELECTRICITY IN WOMEN-RUN SMALL BUSINESSES IN UGANDA

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EXECUTIVE SUMMARY

In Uganda, women make up a large portion of the service sector, notably in informal small and micro businesses such as retail shops, food preparation, tailoring, sewing, beer brewing, basket weaving, healthcare, and hairdressing. Lawrence Berkeley National Laboratory (LBNL), and USAID, in partnership with the Clean Energy Enthusiasts (CEE), a local implementer in Uganda, designed and conducted a participatory survey to collect baseline data and information on the current state of benefits to energy access. The study included data on the uptake of efficient and productive electric (EPUE) equipment, business skills, and financial needs among small and mid-size women-led businesses in Uganda. The objective of the survey was to build evidence and identify economic activities where access to electricity has a positive impact on women's empowerment by helping them develop new and existing businesses, improve productivity, and increase their income. The survey included questions about the type of electric equipment used and needed, electric consumption patterns, alternative sources to electricity, and business and capital barriers related to increased access. The survey results provided the basis for designing a training program tailored to the need of women entrepreneurs in the region.

The survey was conducted in eight districts in Uganda during the period of May 9 through June 14, 2022. Three questionnaires were developed to provide a wide-ranging perspective of the barriers surrounding access to efficient and productive electric equipment. The survey reached a total of 578 women entrepreneurs, 38 financial institutions, and 22 vendors.

A variety of tools that include key informant interview guides and focus group guides were utilized to support the data collection process. The survey was undertaken in urban, semi-urban, and (in some cases) rural settings. This report highlights the main findings of the survey with regards to deploying efficient and productive use of electricity (EPUE) technologies to support women in businesses that have access to electricity.

The main survey findings confirm:

- **Low EPUE adoptions** in most women-led businesses, but **high interest in efficient electric appliances**, such as refrigerators (double door and chest freezers), juice extractors, ice-making machines, electric pressure cookers, hair dryers, electric kettles, photocopiers and printers, and electric sewing machines.
- Additionally, the survey found that **business skills are lacking**, and businesswomen in Uganda are keen to get educational training on EPUE, business development, financial management, access to capital, and business networks and associations.

A summary of all key survey findings is found in the following section.

Entrepreneur Profile. Women entrepreneurs in Uganda are young (34 years old is the average age of the respondents), with some educational background. Only 10% of them have attended institutions of higher education, however 46% have finished high school, and another 16% have attended some post high school education and training. At least 66% are married, and 75% responded that they juggle household and childcare responsibilities with their entrepreneurship duties. The survey found that 48% of businesses operate in the retail industry, trading a wide range of food products and selling household items. Other sectors include the beauty industry (17%), food and beverages (14%), and small-scale apparel (9%).

Electricity access. About 99% of respondents are connected to the grid; however, the survey found low electricity consumption levels across all the businesses, averaging 50 kilowatt-hours (kWh) per month (~\$13). The highest registered consumption is 480 kWh (~\$130). Most of the respondents own electric equipment of some sort, with only 19% of them owning equipment that is not reliant on electricity. This mostly includes: manual sewing and knitting machines, charcoal cook stoves, solar bulbs, manual blenders, popcorn machines, and manual binders and cutters. Most of the equipment that relies on electricity include LED bulbs, TV sets, refrigerators, deep freezers, hair dryers, hand dryers, and sewing machines. While only 15% of the respondents use alternative energy sources to electricity, the survey found that women entrepreneurs spend more on alternative solutions, especially charcoal, firewood, and diesel, with an average monthly spending of UGX 105,859 (~US\$29), compared to ~US\$13 for those on the grid.

Efficient Productive Use of Electricity (EPUE). Despite the low levels of electricity utilization, there is high interest from the participants in electric equipment, more specifically for refrigerators (double door and chest freezers), juice extractors, hair dryers, electric kettles, photocopiers and printers, and electric sewing machines. Eighty-one percent (466) of the respondents would like additional EPUE equipment to support their business expansion. When in use, most of the existing PUE equipment is bought secondhand and is old and inefficient. Because of the old, refurbished equipment, most respondents complained of high-power consumption and frequent repairs due to breakdowns. Seventy-eight percent of the women entrepreneurs think new equipment would lead to an increase in sales and profit.

Efficiency considerations. The survey found that 54% of the participants have never done anything to save energy in their businesses other than reducing the number of hours they use the equipment. This is primarily because they lack knowledge on how to save energy. Of those that know about the benefits of energy efficiency, an overwhelming 97% of them responded that they switch off their equipment to save on energy bills, while only 3% have installed solar systems, primarily for lighting. The survey found that 98% of the respondents have never been offered any

energy efficiency tips by their power utility companies, and 99% of them do not have an energy management plan.

Business skills. Only 23% of respondents said they have had some sort of business development training throughout their lives; 95% said they would like training and hands-on assistance to develop a current business plan. The survey found that only 24% of the women entrepreneurs are members of a business association. Business challenges in running a EPUE business are manifold. They vary from: access to credit, a problem for almost half of the respondents (46%); access to efficient and productive equipment (34% of the respondents consider lack of equipment their major business challenge); access to reliable markets (31%); and access to training (31%). For only 9% of the respondents, access to reliable electricity is considered a business challenge. Other challenges they highlighted include high taxes and local government fees, variations in input prices, and high electricity tariffs, and among others.

Access to finance. Most businesswomen (66%) have commercial bank accounts. Even with this high number of women entrepreneurs holding bank accounts, the survey found a low loan penetration level. About 48% of the women entrepreneurs have never applied for a loan. Of those that have previously applied, 52% found the application process easy, 21% consider the interest rates to be high, 12% found the application process to be difficult, and 10% found the repayment process for the loan too difficult. Access to finance is cited as the primary challenge for business growth. Some of the challenges that hinder women from accessing business loans are insufficient collateral, poor credit history, poor and inconsistent cash flows, poor guarantors, and some behavioral and norm specific reasons, among others. The financial institutions survey found that 92% of financial institutions target women in their lending, and 61% of them offer energy access loans. About 86% of these institutions offer asset financing, and EPUE equipment could be sourced through these programs if banking institutions would receive more EPUE education and training.

SECTION 1: INTRODUCTION

While major energy access programs have contributed to increasing the amount of available energy supplied, more needs to be done to stimulate efficient and productive use to the point necessary to achieve the full benefits of energy access. Overcapacity trends are already emerging in some of the largest economies in East Africa, such as Kenya, Uganda, and Tanzania, where combined peak capacity demand (3,300 megawatts [MW]) stands far below of the installed capacity (5,500 MW) and the total capacity planned for 2030 (10,000 MW) (de la Rue du Can et al., 2022a).

Women are particularly affected by less access to clean energy. They are twice as likely to work in the informal sector, have limited access to capital and financing opportunities to invest in electric equipment, and commonly undertake more unpaid domestic tasks, therefore they suffer from greater time poverty. A review of the literature on the productive uses of energy (PUE) offers valuable insights into male- and female-led business cases, mostly because women tend to operate in smaller and less energy-intensive enterprises, and hence draw fewer benefits from EPUE interventions (Pueyo & Maestre, 2019). The term *productive use of energy* is broadly used to describe income generating opportunities from the use of energy, meaning powering equipment and appliances that are directly used to create a product or provide a service (Bhatia and Angelou, 2015; Brüderle et al., 2011; Doumbia et al., 2013; Johnstone, 2019). While a single, clear definition does not exist, the concept has been widely utilized by development institutions and practitioners in the energy sector for decades, to emphasize activities related to utilization of energy to maximize social and economic opportunities. According to the United Nations Industrial Development Organization, productive use of electricity means directly harnessing job creation and income-generating opportunities for local communities (United Nations Industrial Development Organization, 2023). USAID refers to PUE as the process of powering devices/appliances that can be used in commercial, industrial, and agricultural businesses (Power Africa, 2022). EPUE adds the aspect of *efficiency*, which improves energy access and affordability (de la Rue du Can et al., 2018, 2022b).

Women's participation in business development is hindered by limited access to skills training, financial illiteracy, persistent cultural and gender discriminatory attitudes, and lack of the perceived value of women's work. To address these barriers, energy access programs must broaden their objectives to include women-focused demand-side strategies that promote better access to the services that offer electricity access. That means better access to lighting, refrigerating, cooking, and other productive uses of energy in women-run enterprises. If combined with the concept of energy efficiency, these appliances and other equipment would use less energy, thus generating additional value when providing products and services.

USAID and Lawrence Berkeley National Laboratory (Berkeley Lab) developed the Energy Empowers East Africa (EEEA) program to increase the inclusion of women in electrification

programs throughout East Africa. The aim is to identify key actions that will unlock the benefits of modern energy access for women and enhance their role as agents of change in promoting clean, affordable, and efficient energy use. The program focuses on increasing opportunities for EPUE through community based participatory surveys, educational materials on EPUE, entrepreneurial skill development, access to markets for efficient products, an awareness campaign, financing, and creation of women's self-help networks. As a first step, the program focuses on developing a pilot project in Uganda, implemented through a partnership with the local partner organization, the Clean Energy Enthusiasts (CEE). One of the program's objectives was to conduct research to collect information to improve women's benefits to energy access and increase their role as active citizens in economic development. This research focuses on the energy demand side, particularly by understanding electricity needs through a gender lens, and by assessing the context to which stimulating efficient and productive use of electricity could increase the benefits of energy access.

This report summarizes the results of the research, presenting data and insights from three participatory surveys with three distinctive groups: women-led businesses, electric equipment vendors, and financial institutions in Uganda. The surveys collect a wide range of data on women-run businesses, to assess how women entrepreneurs are coping with financial and non-financial barriers to using electricity for growth. The goal of the surveys is to identify opportunities that will see a multiple line impact on electricity access programs, and to society overall, and provide stakeholders with a baseline on the current state of EPUE uptake in women-led businesses.

The report presents a variety of findings, from the type of businesses that can benefit from better access to electricity to the type of electric equipment currently being used or what could be used in the future. Section 2 focuses on the research design and methodology of the study, and the other chapters bring light on practices and understanding on how women in Uganda currently run their small businesses. It reveals capacity building needs both in EPUE adaptation and other business skills, and it explores attitudes to different types of electric appliances and financing models to increase profit. Moreover, data from a market access perspective tries to increase understanding of the current challenges with domestic supply chains of electrical appliances, and various capital access barriers the sector faces. The data and the analysis in the report have been used to design training materials and conduct capacity building training across eight districts in Uganda, thus supporting women entrepreneurs to fill capacity gaps in accessing and using EPUE.

SECTION 2: METHODOLOGY

Research aim

The main purpose of the research is to identify the type of businesses that women develop with energy access, the type of electric equipment they most likely need to develop their businesses, and the barriers that hinder them in expanding their businesses to the next level. The overall goal of the survey was to address electricity access needs for women entrepreneurs and explore areas where tailored support will allow them to create credibility of their role as agents of change in business development.

The first survey, interviewing women entrepreneurs in Uganda, tries to understand the current level of electricity utilization in women-owned businesses in Uganda, the current state of EPUE, uptake rate, the efficiency rate of their existing appliances. It also sought to get more granular insights on larger aspects of their businesses, including a variety of business development and energy management practices.

The second survey focuses on electric equipment vendors in the country. It collects data on the current state of market availability of electric appliances, energy efficiency rating for the existing inventory, supply chains, and other challenges and opportunities related to EPUE market readiness and accessibility. This component included identifying and surveying local vendors/sellers of electric appliances and understanding the country's domestic supply chain context.

The third survey includes financial institutions, aiming to understand the supply side of financial and capital access opportunities for small and medium enterprises run by women, as well as barriers they face in tapping into this market.

The program used the input from the surveys to build tools to facilitate a three-way capacity building and networking between businesswomen, vendors, and financial institutions. It is structured to support a woman's capacity to develop income-generating activities by using efficient and productive electric equipment, accessing capital, and creating or joining women's self-help networks.

Research assumptions

The general assumption is that barriers exist that hinder women from fully accessing EPUE. These barriers include lack of business qualification, lack of understanding the benefit of energy efficiency, and lack of access to capital and financing. Overall, women do not have the same opportunities as men to take full advantage of new trends emerging in the energy access field, such as fully accessing efficient and productive electric equipment to grow their business. Access to

finance for the acquisition of efficient and productive electrical equipment remains a challenge in emerging markets.

Moreover, having a connection to electricity and access to finance are necessary, and yet not sufficient conditions for transforming these small businesses to their next stage of growth. Generating data to carefully analyze their business needs, identify the technical and economic feasibility of the electric appliances required, and understand market constraints and opportunities can provide customized insights to suit the needs of women entrepreneurs operating in the small-scale business sector in Uganda. Building a baseline with this information has the potential to guide decision-makers and practitioners alike about the gains from the use of electricity for a new production process, involving relevant end-use cases, information on equipment providers, financial institutions, and other relevant policies and programs in this space.

By identifying and addressing barriers related to the lack of EPUE equipment, together with barriers related to business skills and access to capital, *women-led enterprises in Uganda can benefit from the adoption of electric and efficient appliances to grow their businesses further and generate additional income.*

Research methodology

A literature review was first developed to assess the current state of women entrepreneurs' electricity access and EPUE uptake, and to determine the barriers that may prevent them from increased access. The research team reviewed national policy documents, electricity access program and strategic frameworks such as the Uganda Green Growth Development Strategy 2040 (Wheeler, 2017), National Development Plan (National Planning Authority, 2020) and the Agriculture Sector Development Plan (MAAIF, 2016); the Rural Electrification Strategy and Plan 2013-2022 (Rural Electrification Authority, 2013); USAID Power Africa program (Power Africa, 2022); and the Feed the Future program (USAID, 2012). Review of these documents provided context to understand the gaps, institutional framework, and cultural norms in which these businesses operate. Key issues were identified, as well as factors that facilitate or inhibit women's entrepreneurial progress. These insights helped to develop the questionnaire for the surveys. A variety of tools, including key informant interview guides and focus group guides, were utilized to support the data collection process.

Survey population

The survey research targeted women 18 years and older in selected districts, municipalities, and town councils. The survey targeted women entrepreneurs with businesses that rely on both on-grid and off-grid electricity for production, as well as those relying on inefficient diesel for production

processes. It also included women entrepreneurs who do not have access to electricity but could benefit from access to electricity, both on-grid and off-grid, for production efficiencies.

The entrepreneurs were segmented along the lines set up under the National Small and Medium Enterprise Strategy (UIA, 2017), and mostly micro/small enterprises were targeted for the purpose of this survey. A *micro-enterprise* is an enterprise employing up to four people, with an annual sales/revenue turnover or total assets not exceeding Ugandan shillings (UGX) 10 million (~US\$2,600). A small enterprise employs between 5 and 49 and has total assets between UGX 10 million but not exceeding 100 million. The medium-sized enterprise employs between 50 and 100, with total assets between UGX 100-360 million. This delineation was chosen to help determining sample sizing, bankability, networking, identification of policy issues, and linkage with financial institutions, among others.

Prior to the field activities, the local implementing team engaged with the power utility companies and area local leaders and requested them to accompany and introduce the study team to the potential participants. Several focus group discussions with these stakeholders were conducted to design each of the surveys, with a participatory and co-design approach in mind. During the data collection the fieldwork team initiated various lines of communication between potential participants and local leader representatives and/or utility companies.

The team followed the Human Subject Survey protocol on research involving human subjects or human-derived data and was reviewed by the Institutional Review Board (IRB) at Berkeley Lab. The primary mission of the IRB was to ensure the protection of the rights and welfare of all human participants in the research.

The entire survey process was administered on the ground by CEE as the local partner. Data were collected in person, and 578 interviews and surveys with businesswomen, plus an additional 32 interviews with financial institutions and 18 interviews with local vendors were conducted in eight districts in Uganda. The physical questionnaires were collected by enumerators and were kept in a safe and secure location while in the field. Upon return to the office headquarters, they have only been accessed by the researchers for data entry to develop this report.

Sampling size

The survey initially targeted 560 participants based on the number of women entrepreneurs that would be interviewed per district (70 per district), and managed to interview 578 participants in total. This number represented less than 10% of the population targeted per district, and it provided enough diversity in type of businesses represented. The team used purposive sampling, selected from the following associations or groups:

- Women members of Savings and Credit Cooperative societies (SACCOs), women-led cooperatives, producer organizations, and Village Savings and Loans Associations (VSLAs) who own micro, small, and medium enterprises.
- Those in the different industry subsectors, like agriculture, trade, hospitality (accommodation and food services), recreation, e-commerce and personal services, and others which are dominated by women.
- Women business owners with access to electricity or a reliable off-grid solution like solar or diesel that is used in their business.

Recruitment procedure

Based on selected districts, the research team collaborated with respective utility companies and district/municipality/city and town council personnel to identify women entrepreneurs that could benefit from energy efficiency and the productive use of electricity. And with the help of the local leaders, the team selected the businesswomen contacted and vetted them to ascertain their ability and willingness to participate in the research. The CEE team met with district and local leaders to introduce the project and request information on SACCOs and Area Cooperative and Producer Organizations from the District Commercial Officer (DCO), from which about four groups would be selected in each district municipality. The DCO formally introduced the local team to the group leadership committee, which was instrumental in selecting at least 25 women entrepreneurs per group to take part in the survey. The individual selection criteria were based on:

- women membership to a group;
- micro, small, and medium enterprise (MSME) ownership;
- the commodity value chain and process involved in;
- type of energy source used in the business; and
- willingness to participate in the survey.

All participants were contacted initially by a telephone call from the local team, Clean Energy Enthusiasts, using the same script. Each woman identified with a EPUE business had an equal chance of participating in the survey. Prior to the survey beginning, the local team went through the consent forms to ensure respondents understood the purpose of the research and to secure their consent. During the process of recruiting the participants, the CEE team suggested an appointment date and time to meet with each participant. CEE met the participants at their preferred locations or business premises to reduce any major inconveniences on their end. No follow-up was planned.

Survey tools

There were three survey tools (questionnaires, Table 1) designed to target three different groups: women entrepreneurs, financial institutions, and equipment vendors. The businesswomen had different degrees of ability to understand and speak English, so during their administration all the survey materials were translated into the respective local languages, such as Rutooro, Runyankole, Rukonzo, and Luganda, to cover all the eight districts. The survey lasted between 30 to 45 minutes depending on the questions answered, and it contained the following information:

Table 1. Research questionnaires, EEEA

Survey Respondents	Women Entrepreneurs	Financial Institutions	Equipment Vendors
Number of respondents	578	32	18
Number of questions	71	25	22
	<p>The survey was divided in six parts, collecting the following information:</p> <ol style="list-style-type: none"> 1. Demographics 2. Business profile 3. Access to electricity, energy efficiency, and EPUE equipment 4. Business skills and management 5. Energy management/ energy efficiency 6. Access to finance 	<p>The survey was divided in four parts, collecting the following information:</p> <ol style="list-style-type: none"> 1. Demographics 2. Ownership/ structure 3. EPUE credit products 4. Historical lending trends 	<p>The survey collected information on the following:</p> <ol style="list-style-type: none"> 1. EPUE equipment inventory 2. Supply and demand data 3. Challenges with the equipment 4. Warranty issues

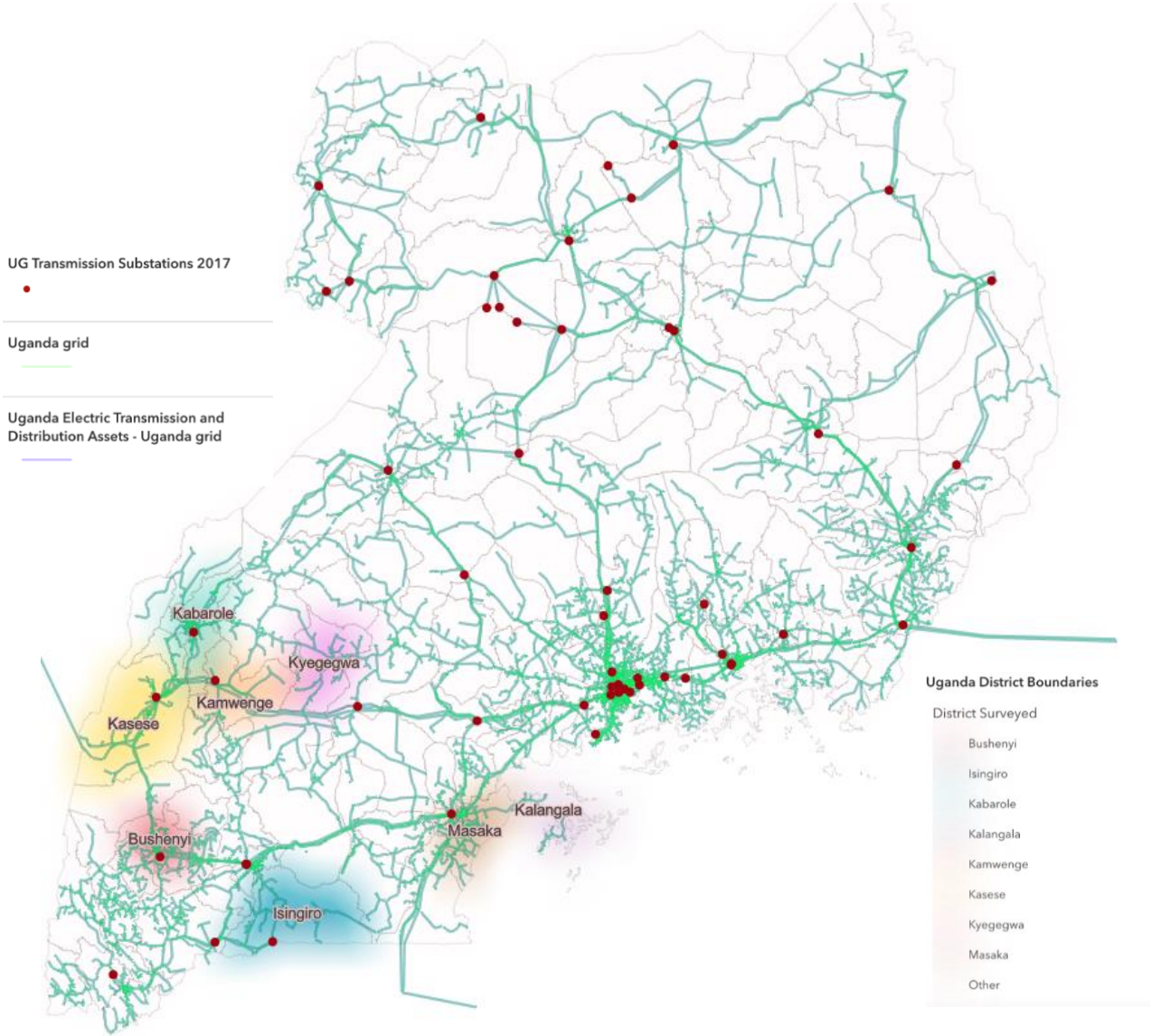
District selection

The survey was conducted in eight districts, located in the West and Southern regions of Uganda (Figure 1). The selection criteria for the eight districts were informed by reviewing key sectoral documents, such as the National Development Plan (National Planning Authority, 2020) and Uganda's National Electrification Strategy (Ministry of Energy, 2020), and interviews with various stakeholders, including local experts in the electrification programs, local nonprofits, and community leaders. The selection also was based on the capacity of leveraging the economic

potential in a specific geographic area through deployment of EPUE equipment. The selection therefore included the following priorities:

- Ongoing energy investments by the Government of Uganda
- Existing USAID and Power Africa programs
- Presence of an Industrial Park or Export Processing Zone
- Objectives described in the National Development Plan and the National Electrification Strategy

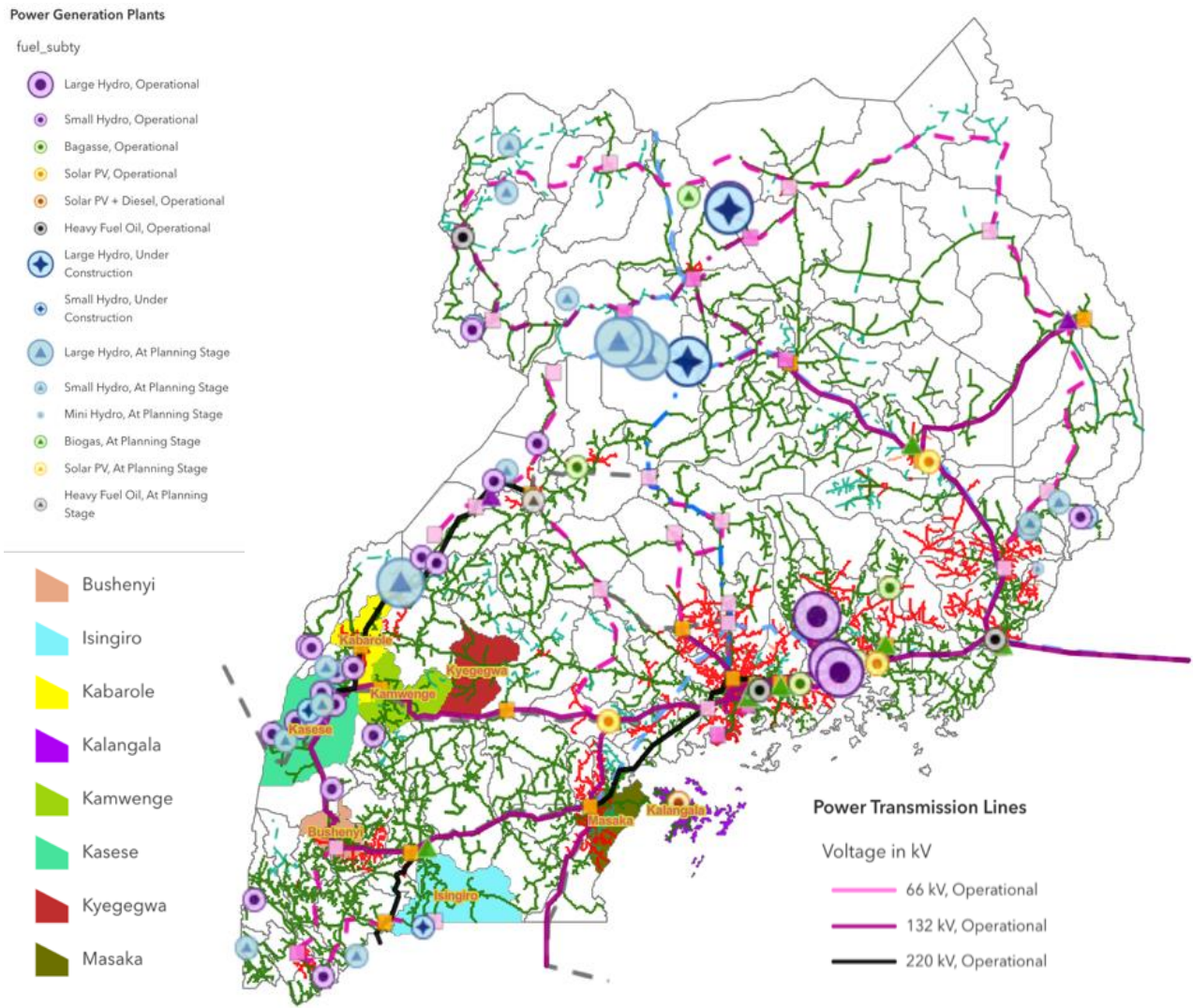
Figure 1. Survey district selection



(Source: Uganda Energy Sector GIS working group, 2021)

Subsequently, the local research team identified areas with a higher electrification (Figure 2), higher percentage of women entrepreneurs, existing EPUE programs, and high strategic areas for investment. The eight selected districts covered were Kalangala, Masaka (Nyendo), Isingiro, Kamwenge Kyegegwa, Bushenyi, Kasese, and Fort Porta (Kabarole).

Figure 2. Electrification Map, Uganda



(Source: Uganda Energy Sector GIS working group, 2021)

The first five districts (Kalangala, Masaka-Nyendo, Isingiro, Kamwenge, and Kyegegwa) are peri-urban in nature, while the other three (Bushenyi, Kasese and Fort Portal) are urban. The survey reached and interviewed 578 women entrepreneurs in total, spread out over 8 districts (Table 2).

Table 2. Number of respondents by district

District	Number of respondents	Percentage (%)
Kalangala	72	12.46
Masaka	70	12.11
Isingiro	72	12.46
Bushenyi	72	12.46
Kasese	74	12.8
Fort Portal (Kabarole)	71	12.28
Kamwenge	77	13.32
Kyegegwa	70	12.11
Total	578	100

Risks and management of risks

The research team identified two major types of risk for this project: (1) data privacy and security (loss of confidentiality), and (2) potential physical and psychological risks.

To avoid the risk that the data could be compromised and individuals who participated be re-identified, the research team applied procedures such as anonymization, password protection, and limiting access to the physical copies to only trusted study team members who completed training in the proper conduct of research.

The COVID-19 pandemic and a new added Ebola risk in Uganda were real potential risks for our study team and the participants in the survey. Our local team followed guidelines of authorities and World Health Organization including having preparedness plans and strictly adhering to the COVID-19 standard operating procedures (masks, handwashing, and social distancing).

The team anticipated that there could be occasionally isolated cases of psychological stress posed to a few of the participants during the interviews as they recollected bad experiences; for example, if they had had issues with electricity providers and other service providers. The team tried to support engagements and facilitate dialogue with representatives of utility companies, who are often invited to attend and address the challenges faced by individuals within the communities.

Data analysis

The data analysis process started with data entry into the Excel software program, and the use of the program statistical function on descriptive analysis. Descriptive statistics were used on the summaries for the socio-demographic characteristics, as well as on the key energy and business variables in this study according to the research methodology. The results obtained were displayed using various graphs and tables. Data presented in percentage form have been rounded off to the nearest whole number in text.

Once initial findings were received, internal work meetings and consultations with experts in the field were held to further tease out the outcomes. The aim of these discussions was to more deeply explore areas concerning female attitudes towards using electricity in their business, and consideration towards financing as a growth mechanism. Furthermore, the team gathered data to gain a deeper understanding of market readiness to accommodate the needs of businesses in regards to electric equipment and preferences for various financing modes. This approach helped to define and/or confirm assumptions and trends displayed in the respondent data.

Research limitations

The research has the following limitations:

- It is predominantly a baseline data gathering survey, and therefore is limited as to the level of the analysis on specific variables or the nature of the relationship among them.
- The survey did not serve as a comparison to male-led businesses, but rather focused purely and solely on female entrepreneurs. More research can be done on male entrepreneurs, EPUE uptake, and the barriers they face, and further comparison can reveal gender-specific attitudes, varying experiences, and similar/different challenges faced.
- The survey is predominantly focused on the urban and peri-urban areas, with little focus on the rural areas, affecting thus a specific type of EPUE end-use case.
- A number of respondents did not answer every question, as none of the questions were mandatory. Several questions were skipped for various reasons, ranging from inadequate information to lack of information, and this is disclosed in every section presented. A higher proportion of questions was skipped in the energy audit section.
- The data provided are based on what the respondents answered. There were no methods employed to independently verify the answers provided. Hence the accuracy is dependent on the entrepreneurs' own willingness to be open and transparent about their businesses.
- The number of sellers surveyed is lower than initially expected and not fully representative of the situation on the ground. Vendors reached to participate in the survey were adamant to provide information on their business and inventory of electric appliances. Off-the-record, several mentioned the fear of being identified for taxation purposes.

SECTION 3: BUSINESS PROFILING

Uganda has a high proportion of women entrepreneurs; one in four of all businesses are owned and run by a woman (UBOS, 2011). Women tend to run businesses that are smaller in size and operate in less profitable sectors than men, mostly in the retail and trade industry. They are usually young, but have a limited educational background (high school) and literacy issues.

Who is she?

Finding: Women entrepreneurs in Uganda are young and have limited educational background.

The survey reveals that the average age of the participants is 34 years old (Figure 3), and their marital status ranges from 66% married, 28% single, and 6% separated and widowed. At least 75% of 578 respondents have a family, and therefore juggle household and childcare responsibilities with their entrepreneurship duties. In terms of education (Figure 4), 18% completed primary and middle school (first through eighth grade), 51% of the responders have completed secondary school (eighth through thirteenth grade, 18% have completed tertiary level studies (post-secondary, vocational skills), and 10% are university graduates. Having attended some level of schooling indicates the capacity of the businesswomen to adopt new skills and techniques, and ably apply them to their business settings.

Figure 4. Educational level of participants

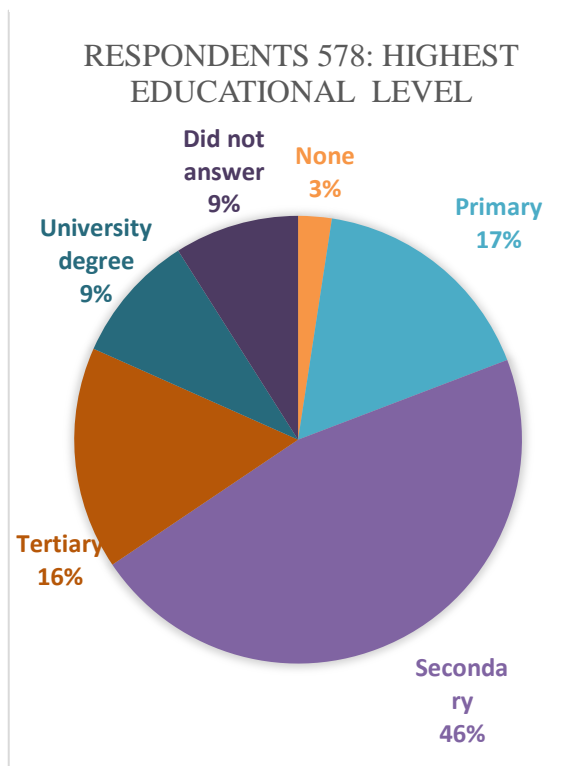
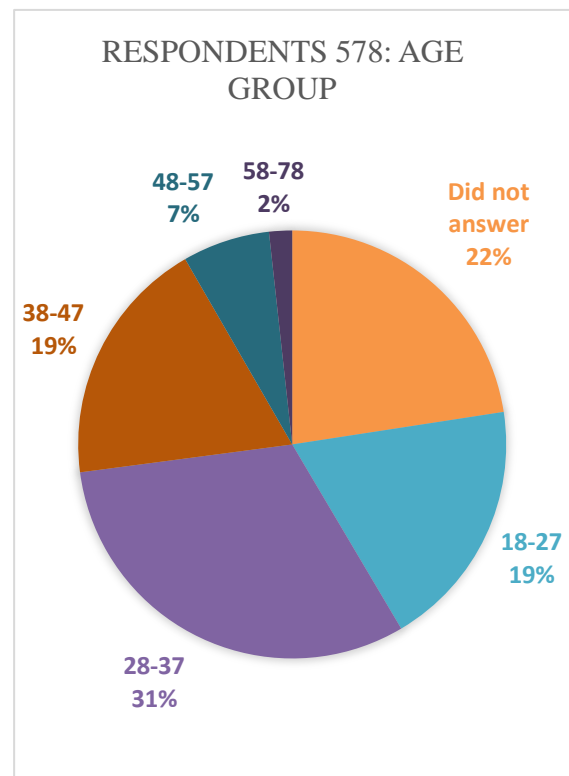


Figure 3. Age of participants

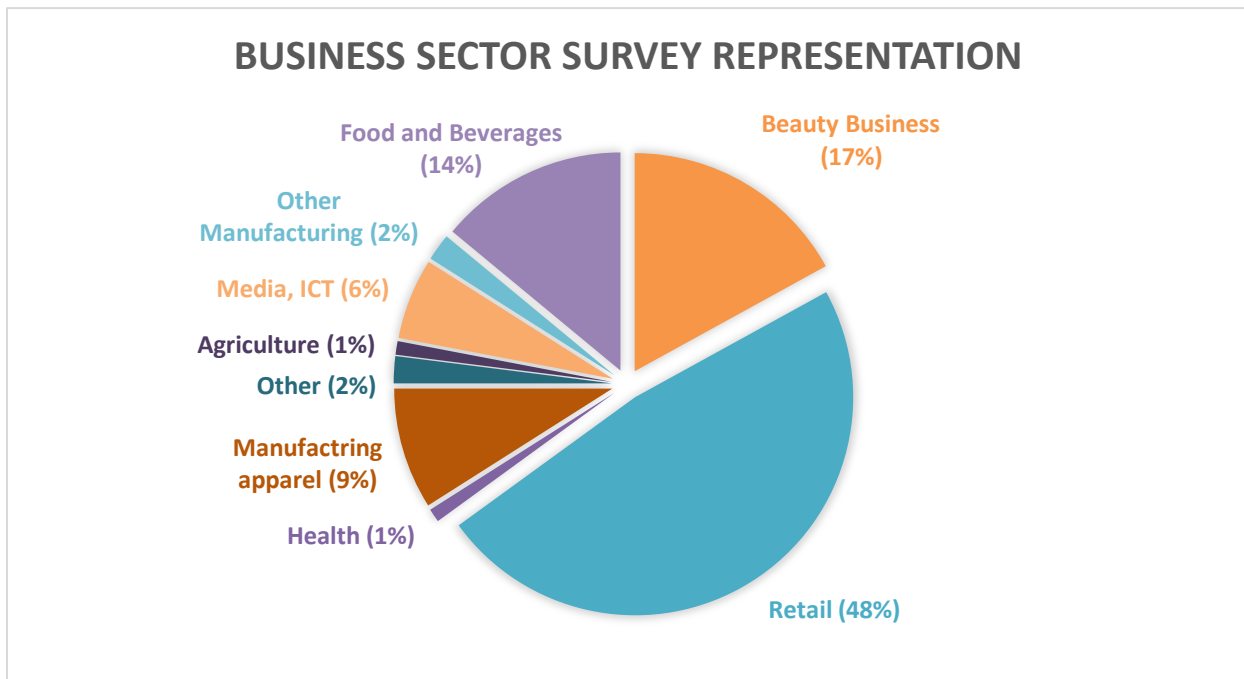


Business profile

Finding: Women entrepreneurs in Uganda are mostly concentrated in the retail industry, owning small retail and commerce shops.

The survey found that 48% of the businesswomen operate in the retail sector, trading a wide range of food products (both fresh and packaged) and other basic household items and small electrical appliances like sockets and bulbs (Figure 5).

Figure 5. Business sector divided by category



These data are consistent with the data reported in the business census program by the Government of Uganda. Other businesses (17%) operate in the beauty industry (hair salons and cosmetics); 14% of the surveyed businesses are in the foods and beverages sector (restaurants, fast food outlets, and bars/pubs), 9% in small scale apparel (tailoring/garments) manufacturing; 5% in media, information, and communication technology (ICT); 2% in small scale manufacturing and processing (groundnut grinding, carpentry, maize milling, and soap making); and the rest in agriculture and fisheries, health, and others. A prominent sector in the services industry includes saloons and small entertainment centers. The other sectors include construction, sale of automotives spare parts, e-commerce, handicrafts, wholesale outlets and repair, and installation of machinery and equipment. Only 1% of the women interviewed are focused in the agriculture sector, mainly because of the urban and peri-urban nature of the survey location. The survey findings disaggregate the business type per district, to understand the prevalence of one sector above the other, and the data confirm that more than 50% of businesses are in the retail sector, with beauty salons being second and food and beverages third (Table 3).

At the individual business level, the survey found that the majority of women own retail businesses, especially those focusing on the trade and commerce sectors. Regarding EPUE, identified businesses include hair salons, small scale tailoring and garments (using a combination of manual and electrical sewing machines), restaurants, and secretarial bureaus. The latter presents a great learning opportunity, as these bureaus can be transformed into multipurpose community tele centers (internet cafes, IT training hubs, secretarial bureaus, and general knowledge exchange centers). Another prominent business for EPUE adoption is dairy processing, with a focus on pasteurization and processing (into yoghurt and ice cream).

Table 3. Business sector categories by district

Districts	Agriculture (%)	Fishery (%)	Food and beverages (%)	Health (%)	Manufacturing (%)	Manufacturing Apparel (%)	Media, ICT (%)	Retail Trade (%)	Beauty Industry (%)	Other (%)	Grand Total (%)
Bushenyi	0.00	0.00	2.78	0.00	2.78	8.33	1.39	51.39	22.22	11.11	100.00
Fortportal	0.00	0.00	14.08	1.41	1.41	2.82	4.23	50.70	16.90	8.45	100.00
Isingiro	5.56	0.00	9.72	1.39	1.39	9.72	8.33	45.83	13.89	4.17	100.00
Kalangala	1.39	1.39	12.50	1.39	4.17	4.17	5.56	47.22	16.67	5.56	100.00
Kamwenge	1.30	0.00	10.39	1.30	0.00	7.79	5.19	49.35	15.58	9.09	100.00
Kasese	1.35	0.00	10.81	0.00	0.00	21.62	2.70	37.84	20.27	5.41	100.00
Kyegegwa	1.43	0.00	5.71	0.00	1.43	5.71	5.71	57.14	20.00	2.86	100.00
Masaka	0.00	0.00	10.00	2.86	4.29	12.86	12.86	44.29	10.00	2.86	100.00

Type of business

Finding: Women entrepreneurs in Uganda organize in business structures as sole proprietorships.

The survey attempted to determine the ownership of the businesses surveyed by asking questions on their registration titles. It was found that 84% of the businesses interviewed are sole proprietorships, 15% are partnerships, and 1% are member cooperatives (Table 4). Other forms of business structures include limited liability companies (0.17%) and women groups or cooperatives (0.17%). Data from the survey demonstrate that not all these businesses (the sole proprietorships, limited liability companies, and partnerships) are formally registered with the Uganda Registration

Services Bureau; however, they trade with business names, from which they pay local council trading licenses. Most of the respondents do not know the process of registration, while others wrongly think that if they formally register, then they will start paying additional taxes. This is interesting considering that most businesses have been in existence for more than 10 years, but it also speaks to the need for self-help networks that can help such entrepreneurs with access to information and networking.

Table 4. Businesses registration titles

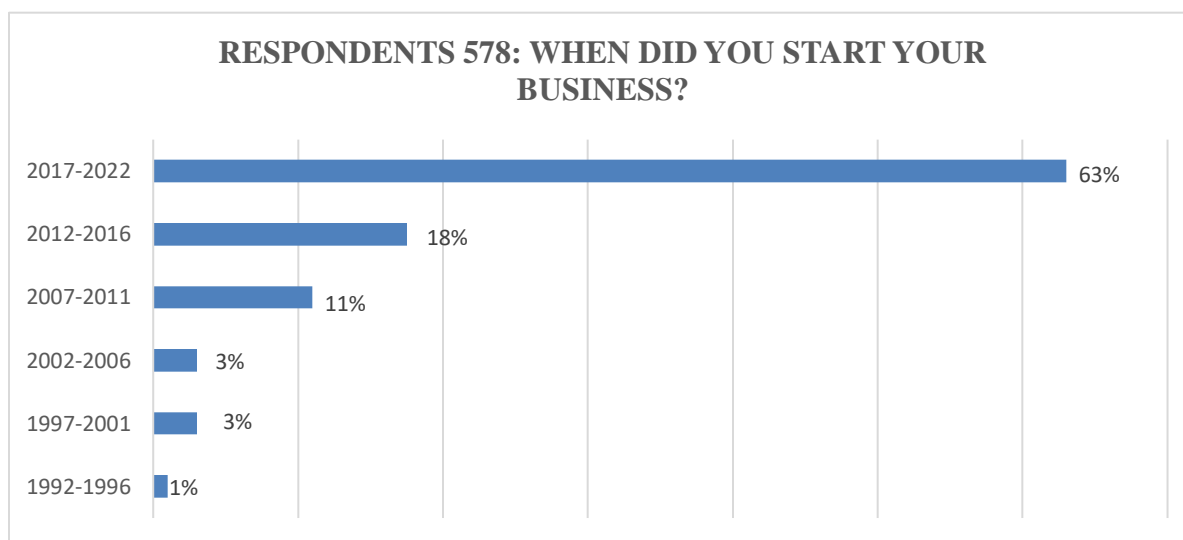
TOTAL RESPONDENTS 578: HOW IS YOUR BUSINESS REGISTERED?	
Options	Respondents (%)
Limited Company	0.17
Sole Proprietorship	84
Partnership	15
Co-Ops	1
Other	0.17

Business size and revenue

Finding: Women entrepreneurs in Uganda have started their businesses in the last five years.

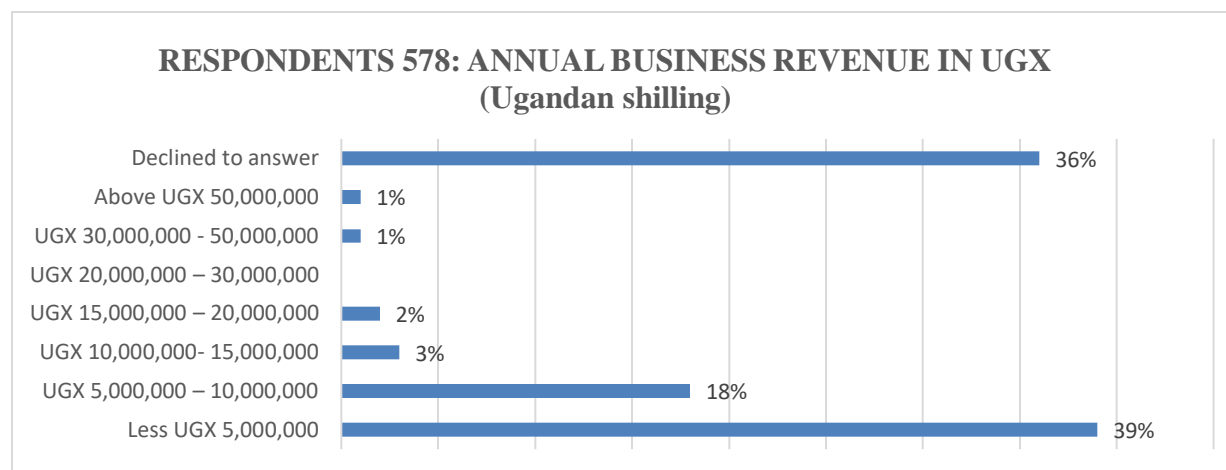
The businesses surveyed are relatively young and small (Figure 6). Sixty three percent of them have been in operation for about five years, with 30% in operation for less than two years.

Figure 6. Average business duration in years



The short amount of time these businesses have been in operation demonstrates that there is an opportunity to help these young entrepreneurs solidify their business practices, guide them on how to access capital, and introduce them to new and efficient technology with the goal of increasing their revenues. The survey found that most entrepreneurs work six to seven days a week.

Figure 7. Annual business revenues in UGX



Regarding their annual business revenues (Figure 7) only 1% of the women surveyed have revenues above UGX 50,000,000 (US\$13,000). Most of the businesses interviewed (~39%) earn less than UGX 5,000,000 (US\$1,300) annually, and 18% them earn between US\$1,300 to US\$2,600. The highest revenues, clustered by sector, seem to be mostly in the agriculture-retail sector, such as the peanut grinding business. Regarding the number of employees (Table 5) 67% did not answer this question, but from the 32% who did answer, 40% declared having 1 employee, 43% claimed 2 to 3 employees (a combination of both family and hired labor), and the rest varied. Only 3 from the total 578 businesses surveyed claimed about 10-12 employees.

Table 5. Total number of employees per business

NUMBER OF EMPLOYEES	NUMBER OF BUSINESSES	% OF BUSINESSES FROM THE TOTAL SAMPLE	% OF BUSINESSES THAT ANSWERED THE QUESTION
Options	Respondents	Respondents (%)	Respondents (%)
Did Not Answer	381	67	-
0-1	76	13	40
2-3	81	14	43
4-5	22	3	12
6-7	4	0.7	2
8-9	3	0.5	1.5
10-12	3	0.5	1.5
Total	189	32%	100%

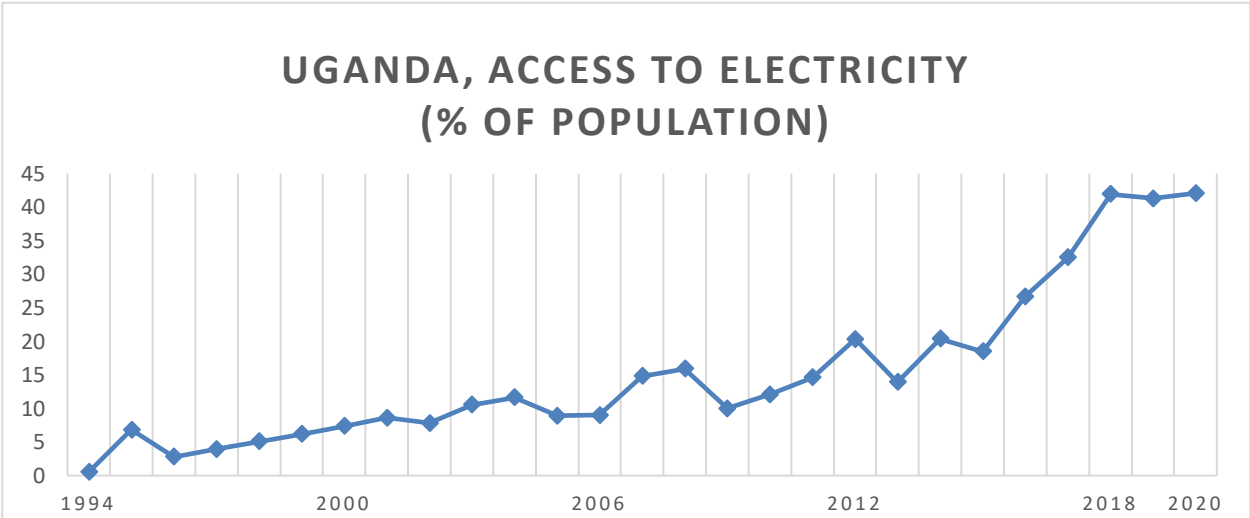
SECTION 4: ELECTRICITY ACCESS AND EPUE EQUIPMENT

Access and connectivity

Uganda has made substantial progress in electrification (Figure 8), increasing the access rate from 12% in 2010 to 45% in 2022 (World Bank, 2022). Despite this, 25 million people still lack electricity, with rural areas facing an 8% access rate (Kaijuka Okwenje, 2023). Moreover, even when women do have electricity access, their usage remains low because a number of barriers prevent them from taking full advantage of energy services. Beyond a simple electricity connection, realizing the benefits of energy access requires *affordable electricity* and *efficient equipment* to run machinery, heating, cooling, lighting, digitizing, communicating, and more.

This research focuses on accessibility issues for women-run businesses beyond simple connectivity issues. Connectivity alone does not measure the level of access to energy services, which can paint a completely different picture of accessibility. The World Bank has introduced a multitiered framework to define and measure electricity access, moving away from the binary connected/non-connected approach, emphasizing the difference between “access to electricity supply,” “access to electricity services,” and the “actual use of electricity” (Bhatia & Angelou, 2015). This section lays out the survey findings about sources of energy in women-run businesses in Uganda, the level of consumption, the type of equipment used, the type of equipment that is desired, and electricity costs, among other energy access data. It presents findings specific to the context of small and medium enterprises and provides contextual insights from a gender perspective.

Figure 8. Energy Access Rate in Uganda



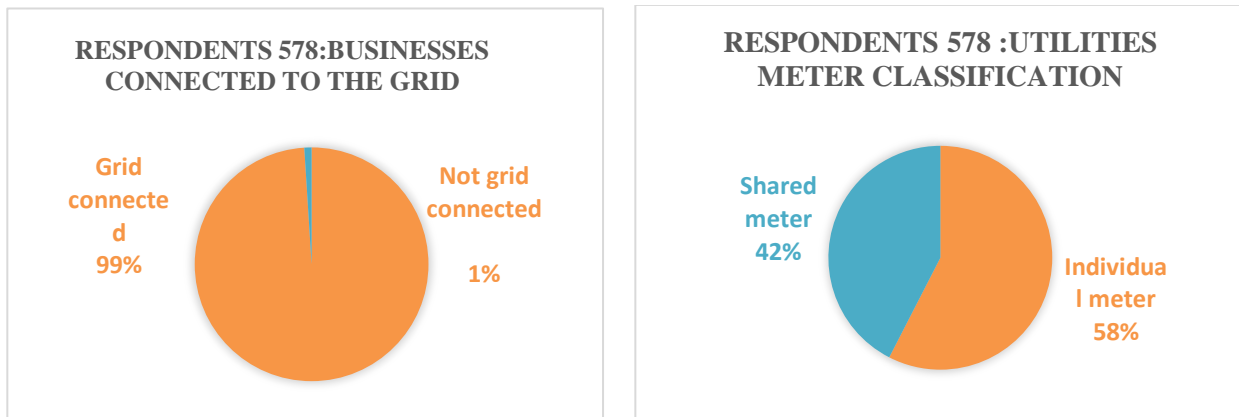
Source (EIA, 2022)

Electricity access

Finding: Women entrepreneurs in Uganda are connected to the grid and have had an established electricity connection for more than two years.

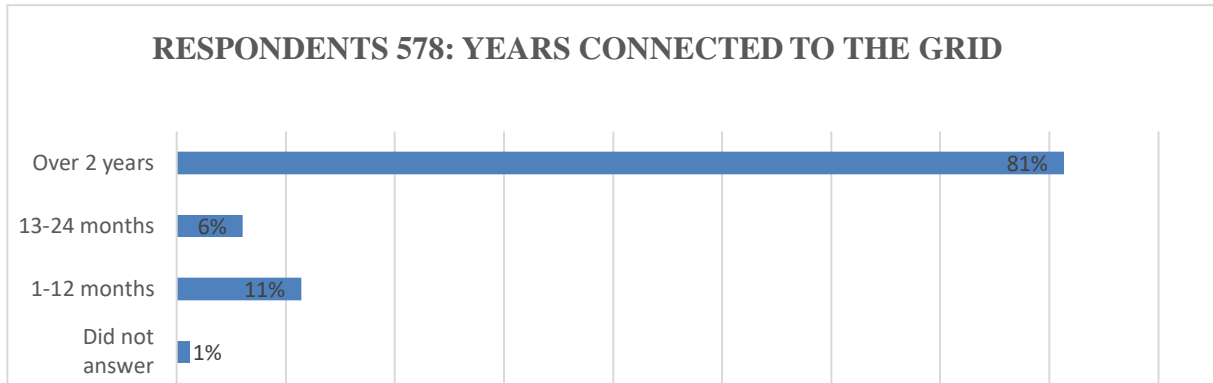
The survey found that 99% of the respondents are connected to the grid (Figure 9). The 1% not connected to the grid attributed this to: high connection costs, inability to afford to pay for the electricity, high costs associated with converting from off-grid to on-grid, and delays in executing new connections by utilities.

Figure 9. Grid connection and meter allocation



Most of those not connected to the grid businesses use a combination of solar lanterns for lighting and biomass for cooking and any agro-processing work. The survey found that 58% of the women entrepreneurs have individual meters, while 42% have shared meters. Of those connected to the grid, 82% have had access to electricity for more than two years (Figure 10). This finding demonstrates that most of the respondents have had electricity for a long enough period to have considered and started a EPUE business. In areas where there are shared meters, especially in the territory served by Kyegegwa Rural Electricity Cooperative Society (KRECS), there is less EPUE activity due to conflicts that arise from a determination of who pays the electricity bills.

Figure 10. Time connected to the grid



Cost of energy

Finding: Women entrepreneurs in Uganda consume 50 kilowatt-hours (kWh) of electricity a month on average (~US\$13).

The survey found that the monthly average consumption among participants is ~50 kWh (~US\$13), which is quite low. The maximum registered consumption per month is 480 kWh (~US\$130). The survey found that 15% (88) of the women use other alternative energy sources (Figure 11). Around 58% use biomass-based energy, especially charcoal (especially for cooking, bread products, pasteurization of yoghurt, etc.), 18% use solar systems, and only 9% use generator sets.

- **Monthly consumption**
50 kWh (~US\$13)
- **Maximum registered consumption**
480 kWh (~US\$130)

According to the respondents, the alternative solutions are used because they are cheaper (72%), more reliable than the national grid (18%), and readily available (6%). Interestingly, the survey found that women entrepreneurs spend more on alternative solutions, especially charcoal, firewood, and diesel, with the average monthly expenditure at UGX 105,859 (~US\$29 compared to ~US\$13 for those on the grid). This speaks to the need for behavior change messaging on proper analysis of energy costs, conversion from diesel-powered systems, and energy efficiency.

Table 6 shows the alternative energy choices, disaggregated by type.

Figure 11. Alternative Energy Sources

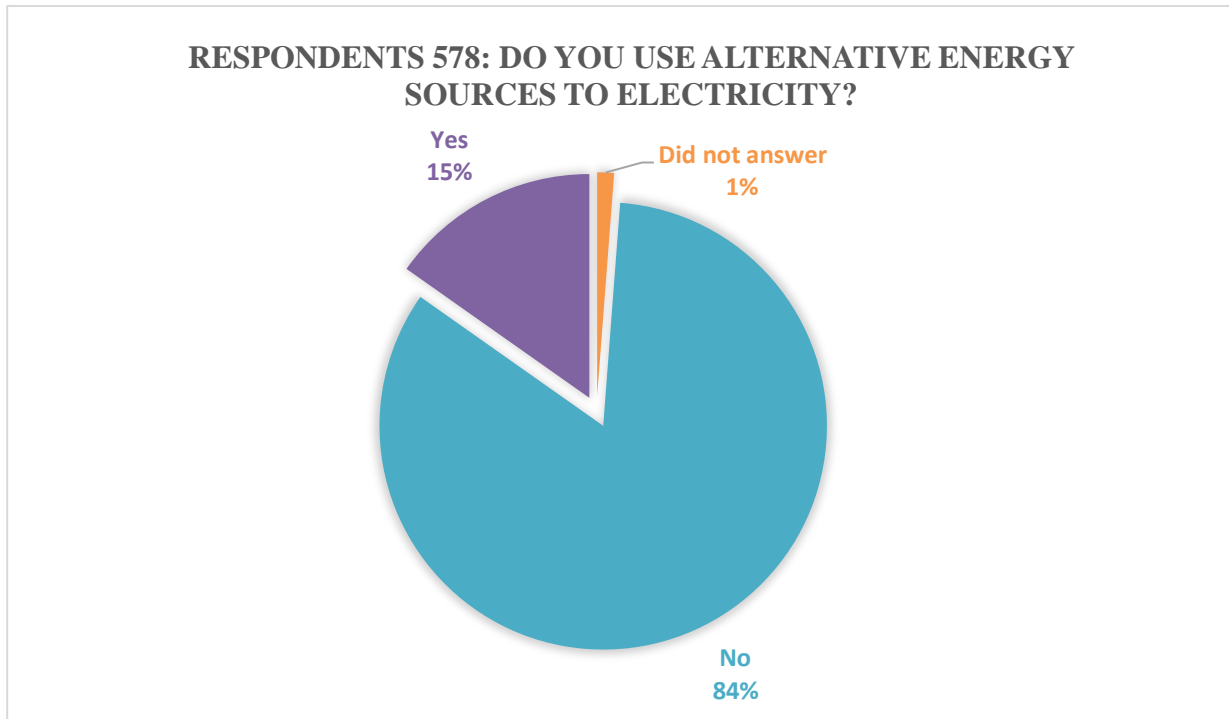


Table 6. Alternative energy choices disaggregated by type

ALTERNATIVE ENERGY SOURCES	RESPONDENTS (%)
YES (What is the reason?)	88 (15%)
Candles	1 (1%)
Cheaper	1
Charcoal	51 (58%)
Cheaper	45
Electric equipment too expensive	4
More reliable than national grid	1
Readily available	1
Firewood	7 (8%)
Cheaper	3 (43%)
Readily available	4 (57%)
Generator	8 (9%)

Cheaper	1 (12.5%)
More reliable than national grid	7 (87.5%)
Cheaper	5 (6%)
Solar	16 (18%)
Cheaper	8 (50%)
More reliable than national grid	8 (50%)

The survey findings show what percentage of the respondents' business costs are associated with energy costs (

Table 7 and **Error! Reference source not found.**). For 42%, energy costs constitute 0%-5% of their overall business costs, and for 33% of them, 5%-10%. For 4% of the total businesses, energy costs account for 10%-20% of their expenses. Less than 1% of the businesses have energy costs that are above 50% of the total business costs. And 7% of the women could not estimate their total monthly expenditure on energy. The variation in the contribution of the energy costs highlights the need for technical guidance on energy management, including the promotion of EPUE equipment.

Table 7. Percentage of business costs associated with electricity costs

Sectors	% OF BUSINESS COSTS ASSOCIATED WITH ELECTRICITY COSTS						
	0%-5% (%)	5%-10% (%)	10%-20% (%)	20%-30% (%)	30%-40% (%)	Above 50% (%)	Total (%)
Agriculture	0.74	0.37	0.00	0.00	0.19	0.00	1.30
Fishery	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Food and beverages services	1.85	1.67	3.15	1.11	1.30	0.37	9.44
Health	1.11	0.00	0.00	0.00	0.00	0.00	1.11
Manufacturing	0.37	0.74	0.37	0.19	0.19	0.19	2.04
Manufacturing of wearing apparel	4.81	2.78	0.74	0.00	0.00	0.00	8.33
Media, information, and communication	2.78	1.85	1.11	0.19	0.00	0.00	5.93
Retail	23.33	18.52	5.37	0.56	0.56	0.19	48.52
Blank	9.63	9.07	4.26	0.00	0.37	0.00	23.33
Grand Total	44.63	35	15	2.04	2.59	0.74	100

Figure 12. Percentage of business costs associated with electricity costs

Type of electric equipment in use

Finding: Women entrepreneurs in Uganda use old and refurbished appliances in their businesses. This equipment is highly inefficient, which increases electricity costs and repairs because of frequent breakdowns.

The study found that from the 99% of enterprises with an electricity connection, only 19% of the respondents have equipment that is not reliant on electricity, such as manual sewing and knitting machines, charcoal cook stoves, solar bulbs, manual blenders, popcorn machines, and manual binders and cutters. Most of the equipment that relies on electricity include TV sets, refrigerators, deep freezers, hair dryers, and sewing machines (Table 8).

Table 8. Most used electric appliance

MOST COMMON TYPE OF ELECTRIC APPLIANCE USED BY THE RESPONDENTS	NUMBER OF RESPONDENTS	%
Refrigerators	241	42
Deep freezers	139	24
Sewing machines	53	10
TV sets	131	23
Hair dryers	70	12

Some observations are made about the common electrical equipment used:

TV sets

About 131 respondents (23%) have TV sets, and these were purchased new in 85% of the cases, at an average price of UGX 394,000 (~US\$110). Of the 131 respondents with TV sets, 62% of the equipment was small (14-inch) with an average capacity of 55 watts (W), 32% were medium sized (21-inch), with an average electricity rating of 70 W, and 6% were larger than 21 inches, averaging 120 W (Table 9).

Table 9. TV set power ratings

TV Sets (average price UGX 394,000 [US \$110])		
<i>Size</i>	<i>Percentage of TV Owners (%)</i>	<i>Power Rating (W)</i>
Small (14-inch)	62	55

Medium (21-inch)	32	70
Large (>21-inch)	6	120

Refrigerators

Refrigerators are one of the most common pieces of equipment, or one of the most needed among businesses. About 42% (241) of the respondents use their own refrigerator and use it for an average of 31 hours, with a median usage of 22.5 hours a week. These data confirm a common practice identified among businesses in the survey: they regulate and limit the hours of use for refrigerators, especially during the night, in order to reduce power consumption and consequentially pay less in electricity bills. A majority of the refrigerators, 130 of them (73% of the total), were bought new at an average cost of UGX 897,000 (US\$235) using individual savings; 26% of the refrigerators owned are small (~85 liter) and have power ratings (Table 10) ranging from 182-332 kWh, with a median rating of 272 kWh; 41% are considered medium size (~220 liter), with a rate ranging from 182-520 kWh, with an average of 250 kWh. And 32% are large (450-600 liters), ranging from as low as 183 kWh to 449 kWh. Some 26% (60) of them were acquired from fast moving consumer goods companies that provide logistical support to ease market penetration. These include Coca-Cola, Pepsi, Riham, and Uganda Breweries Limited and were provided at no cost. These refrigerators are highly inefficient and put a strain on already overburdened businesses costs.

Table 10. Refrigerator power ratings

Refrigerators (average price UGX 897,000 [US\$235])		
<i>Size</i>	<i>Percentage of Total Respondents (%)</i>	<i>Rating/Consumption (kWh)</i>
Small (~85-200 liters)	26	182-332
Medium (~220-450 liters)	41	182-520
Large (~450-650 liters)	34	183-449

Deep Freezers

Regarding deep freezers, only 24% (139) of businesses surveyed own them and mostly they use them 24 hours a week. Of those owned, 74% (102) were purchased new at average cost of UGX 930,000 (US\$245). As with the refrigerators, respondents admitted turning them on and off as needed, to save on electricity costs. Some 60% of these freezers are of medium size, up to a 400 liter capacity, and have a power rating ranging 182-422 kWh (an average rating of 319 kWh); the small freezers (~250 liter capacity) rate 256-292 kWh, and the large freezers (up to 600 liter capacity) rate 254-398 kWh (Table 11).

Table 11. Deep freezers power ratings

Deep Freezers (average price UGX 394,000 [US\$110])	
<i>Size</i>	<i>Rating/consumption (kWh)</i>
Small (up to 250 liters)	256-292
Medium (up to 400 liters)	182-422
Large (up to 600 liters)	254-398

Hair Dryers

Of the women in salon/beauty businesses, 70% (70) own hair dryers, which are used for an average of 14 hours a week. These dryers were purchased new for 88% of the businesses, at an average cost of UGX 565,000 (US\$148), and are used in commercial salons. The power rating (Table 12) for these hair dryers ranges from 500 W to 3,000 W, with the most common rating at 1,100 W. About 73% of the salon businesses (72) also own hand dryers that rate from 100-3,000 W. On average, 97% of the hand dryers were bought new, at an average cost of UGX 81,000 (US\$22).

Table 12. Hair dryer power ratings

Hair Dryers (average price UGX 565,000 [US\$148])	
<i>Size</i>	<i>Rating/consumption (W)</i>
Small	500
Medium	1,100
Large	3,000

Electric Sewing Machines

Tailoring is a prominent women-led business. Of the 17% (53) women that own such businesses, 9% use only electric sewing machines, 25% use both manual and electric sewing machines, and 66% use only manual sewing machines. The electric sewing machines are mostly used for 33 hours a week. The average cost is UGX 1,200,000 (US\$315) when bought new, which is unaffordable for many tailors. Almost all the women in this category prefer electric sewing machines. Types of sewing machines (average price UGX 1,200,000 [US\$315]) are shown in Table 12.

Table 13. Sewing machine usage by type

Types of Sewing Machines (average price UGX 1,200,000 [US\$315]) (Average usage 33 hours/week)

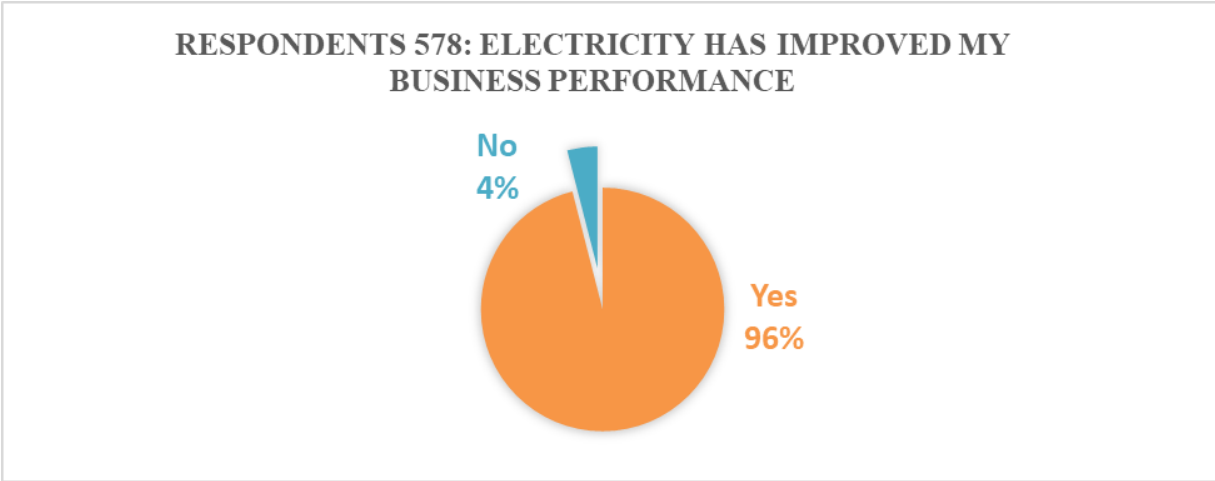
<i>Sewing Machine Type</i>	<i>Frequency</i>	<i>%</i>
Only electric	5	9
Both manual and electric	13	25
Only manual	35	66
Total	53	100

Impact of electricity on existing businesses

Finding: Women entrepreneurs in Uganda recognize the benefits of electricity to grow their businesses and would like to use it as an opportunity.

There is high recognition of the role of electricity access in improving business performance. Some 96% of the respondents confirmed that electricity access improved their businesses (Figure 13) by helping them attract more customers, improve the quality of goods and services offered, work longer hours, and reduce the number of losses incurred. The survey demonstrates that 66% of businesswomen are able to assess the costs and benefits of buying electrical equipment. While they do not conduct any product life cycle cost analyses, they undertake a basic analysis that focuses on number of sales and profits, quality services, increased efficiency (savings), and output. Only a few have had negative effects that they associate with the high monthly energy bills. About 25% (143) of the respondents answered that they experience difficulties paying their monthly electricity bill (Table 14). To this end, there is increasing focus on the impact of access to electricity on products sold. Because of repeated calls for improved power reliability, the survey attempted to determine the impact of unplanned interruptions or network downtime on businesses. As a result,

Figure 13. Positive impact of electricity on business performance



46% of the respondents confirmed that they have previously lost products (spoilage) due to power blackouts. This speaks to the need to improve power quality and reliability.

Table 14. Respondents' ability to pay for electricity costs

Do you have difficulties paying the monthly electricity bill?	Respondents	%
YES	143	25
NO	430	74
Did not answer	5	1

Efficiency considerations

Finding: Women entrepreneurs in Uganda have not been offered energy efficiency guidelines, and they lack energy management plans for their businesses.

The survey also focused on determining the level of knowledge by women entrepreneurs in applying basic energy efficiency and management practices in the management of their EPUE businesses. The survey found that 54% have never done anything to save energy in their businesses except for reducing the number of hours they use the equipment, and this is primarily because of lack of knowledge on how to save energy.

Of those that know about energy efficiency, over 97% just switch off their equipment to save on energy bills, while 3% have installed solar systems, primarily for lighting. Ordinarily, the expectation would be that the decision to purchase EPUE equipment should consider the operating cost of electricity consumption by looking at the energy performance of the equipment. That would help women entrepreneurs determine the most cost-effective option among different competing alternatives to purchase, own, operate, maintain, and dispose of it in the future. Unfortunately, this is seldom done.

Using a Likert scale, the survey assessed the major considerations for buying electrical equipment five being the highest rank, the survey found that most women entrepreneurs consider the upfront cost of the equipment as the primary decision influencer, irrespective of accruing efficiency benefits; demand is more sensitive to equipment up-front costs (Figure 14 and **Error! Reference source not found.**). Therefore, even for those that try to assess the return on investment, the analysis is very basic and focuses on increments in productivity or increase in customers served.

Figure 14. Decision-making factors for acquiring electric equipment

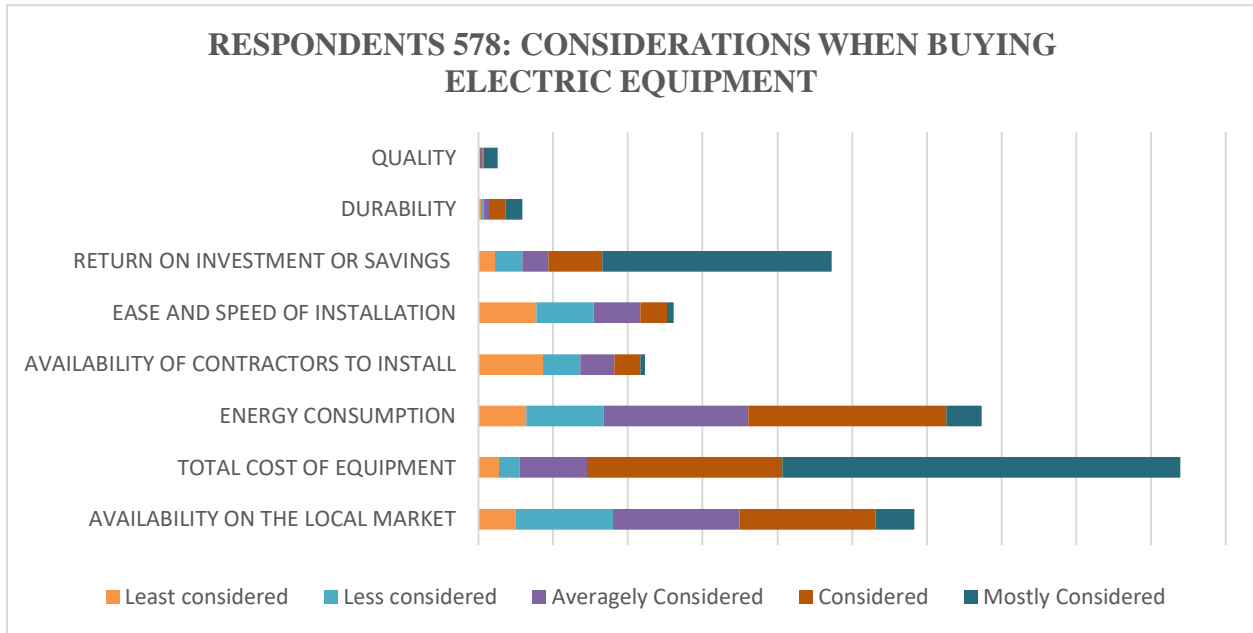
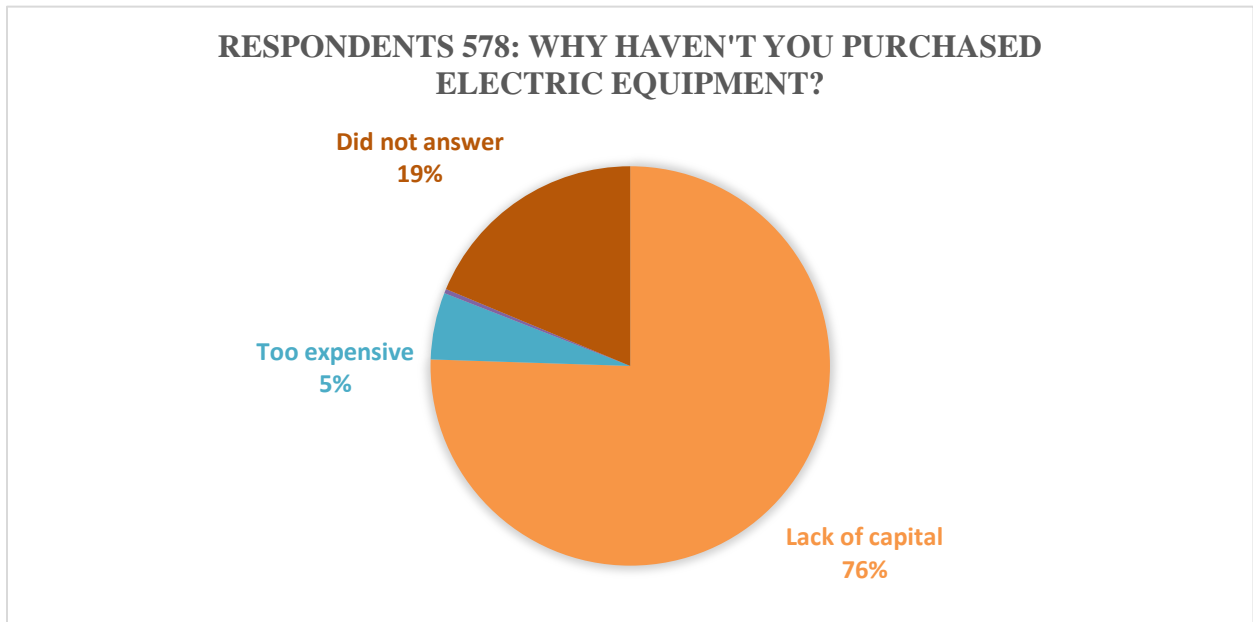
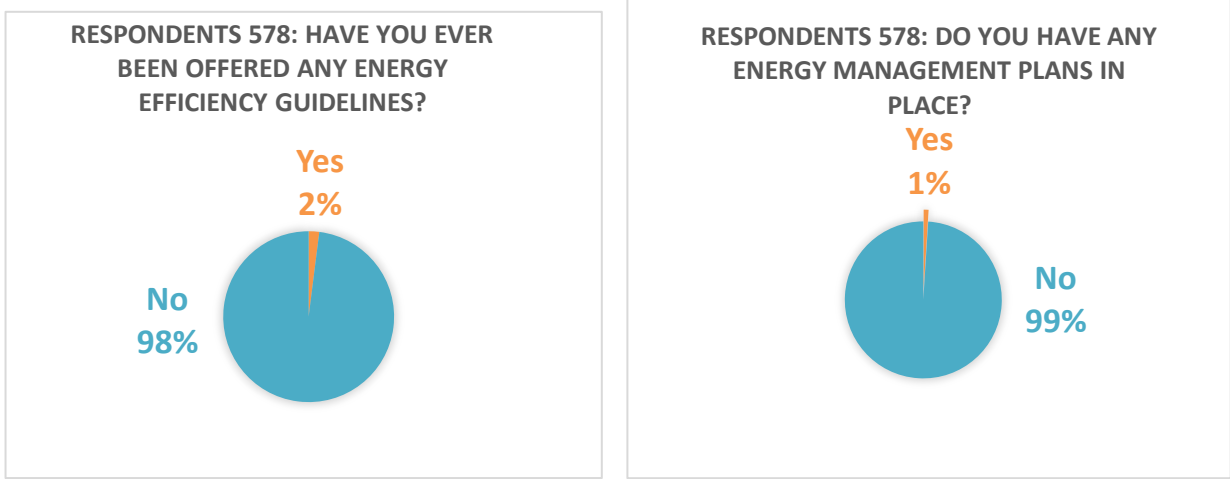


Figure 15. Reasons for not acquiring new EPUE



This often does not portray a true picture of the return to the EPUE business arising from the procurement and installation of an electrical appliance. After installing a piece of equipment, it is important that basic energy management practices are adopted, and one of the expectations is that power utilities share information on energy efficiency. The survey found that 98% of the respondents have never been offered any energy efficiency tips by their power utility companies (Figure 16). With the lack of access to information on energy management, it is impossible for it to be integrated into the operations of the businesses. Indeed, the survey found 99% of the respondents lack energy management plans for their businesses (Figure 17).

Figure 16. Presence of energy efficiency guidelines Figure 17. Presence of energy management plans



Challenges with existing equipment

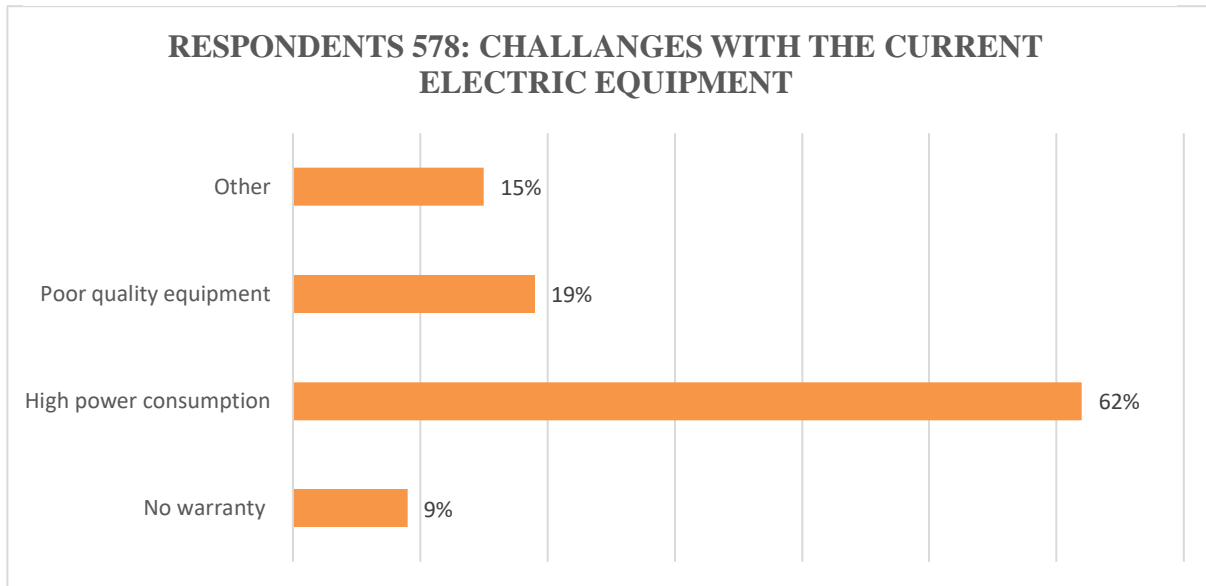
Finding: Many pieces of equipment have exceeded their lifetime and have been refurbished over time.

To be able to understand the current state of play regarding existing EPUE equipment, the survey identified the main challenges that EPUE women entrepreneurs are faced with (Figure 18):

- Most of the equipment in use consumes a lot of electricity relative to its productive use. The reason is that much of the equipment has exceeded its lifetime and has been refurbished over time. Other end users seldom consider system ratings and specifications in their purchase decision.
- The women entrepreneurs deem most of the equipment to be of poor quality and inefficient on the basis of the life of the equipment, frequent failures, and performance. In most districts beyond the capital, there is a clear lack of a variety of new EPUE equipment that can be bought.

- There is lack of equipment warranties and guarantees. With power quality and reliability issues, and the absence of sufficient end-user training, women entrepreneurs are unable to replace or repair an appliance when it is faulty. They often lack these skills, and vendors rarely provide service and maintenance training.

Figure 18. Challenges with the current equipment



Demand for EPUE

Finding: Women entrepreneurs lack information on the specific type of efficient and productive equipment that exist to develop their businesses.

An optimistic finding is that the demand for EPUE equipment exists (Figure 19). About 884% of the respondents would like additional EPUE equipment to support their business expansion. The need for equipment is present across all the small businesses and includes demand for refrigerators, deep freezers, hair drying equipment, groundnut grinders, blenders, electric kettles, juice extractors and dispensers, electric sewing and knitting machines, and milk coolers, among others (Figure 20). Seventy-eight percent of the women entrepreneurs think this equipment would lead to an increase in sales and profit.

Figure 19. Need for additional EPUE

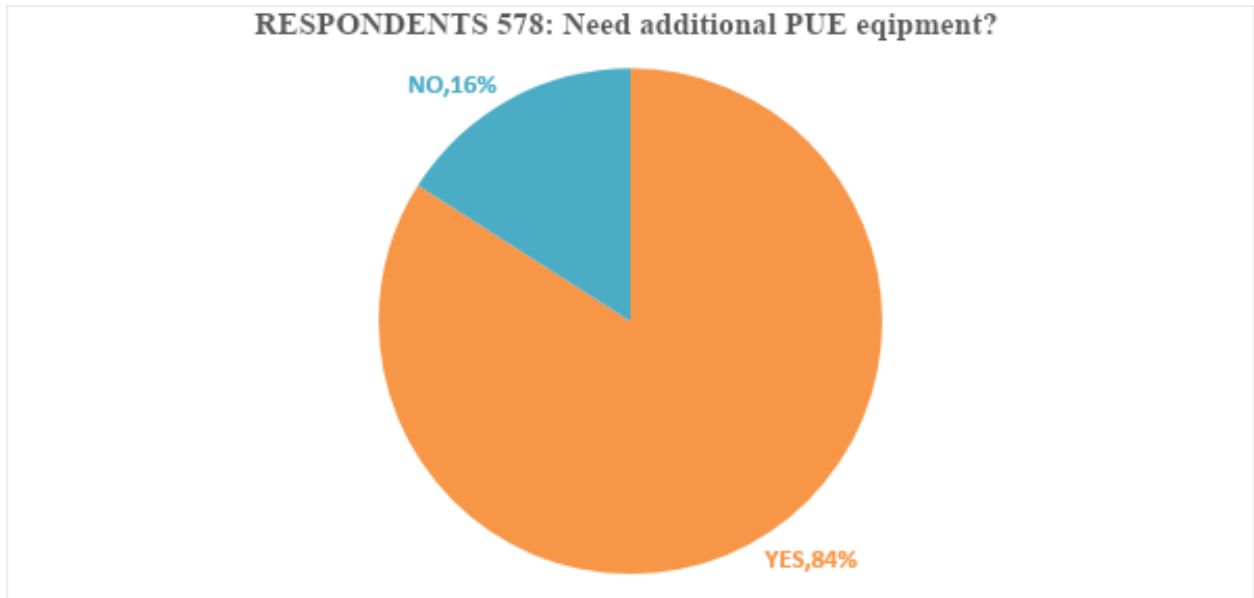
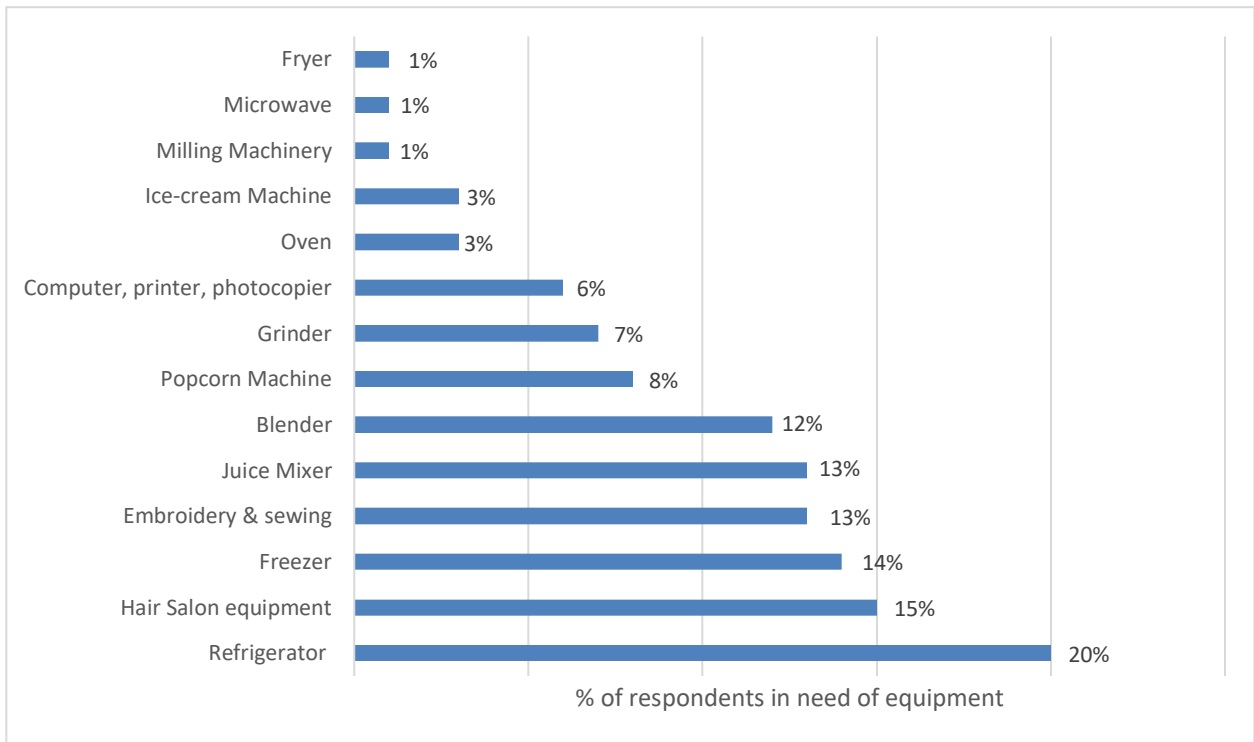


Figure 20. Type of equipment needed by category



From conversation with the women entrepreneurs, it became clear that they lack information on the specific type of EPUE equipment that makes sense for their businesses. The findings show that there is lack of face-to-face engagement with equipment vendors. The survey found that 54% of the respondents do not have equipment vendors in their locality. Seventy percent of the respondents confirmed that equipment vendors do not provide them with information on the energy consumption levels of the equipment bought, which partly explains the presence of refurbished and highly inefficient equipment. Surprisingly, 71% know that some equipment is more efficient than others, but this is often not the driving acquisition decision influencer.

SECTION 5: MARKET ACCESSIBILITY

Finding: Women entrepreneurs in Uganda lack basic business and management skills, and 95% of them would like to receive support to develop a business plan.

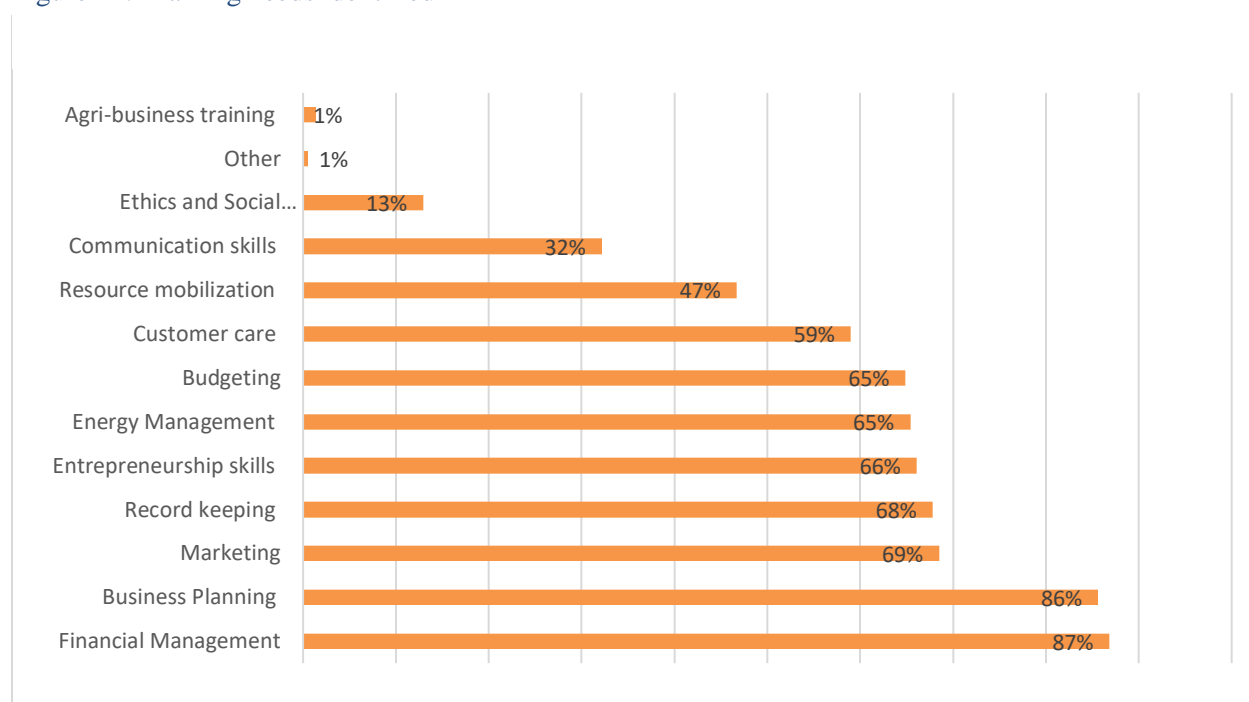
This section lays out the capacity gaps and training areas identified to boost the adoption and better use of EPUE equipment.

Business skills and management

The survey found that 23% of women entrepreneurs have undertaken some previous business training throughout their lives. The majority of areas where they have been trained over the last years are business planning, financial management, customer care, recordkeeping, and budgeting. The survey also confirmed that out of the 23% that have received training in the last three years, 95% use the skills acquired to run and manage their EPUE businesses. Of the 23% that have received previous training, more than half (53%) have developed a basic business plan for their business. These demonstrate the importance of business skills training.

It is apparent that additional training is needed to improve the capacity of women entrepreneurs to start, improve on, diversify, and better manage their EPUE businesses. For example, 95% of the women respondents would like training to develop a business plan, primarily to source for financing but also to have a structured way of managing their businesses. Other training areas identified include business planning, financial management, customer care, records and bookkeeping, marketing, entrepreneurship (identifying and starting a business), and energy management, among others (Figure 21).

Figure 21. Training needs identified



Membership to self-help groups or business associations

Finding: Only a small number (24%) of women entrepreneurs in Uganda belong to business associations, and only 22% belong to a women's association or grassroots organizations.

Membership to business support groups, apex bodies, and other self-help groups plays an important role in women networking, learning and adaptation, sharing lessons and success stories, capacity building, and identifying opportunities. The survey found a lack of membership to such networks. Only 24% of the women entrepreneurs surveyed are members of a business association (Figure 23). The survey also found that only 22% are members of women's associations and/or groups, with the bulk of these being grassroots VSLAs (Figure 22), where a group of women get together and contribute weekly or monthly savings, which are thereafter distributed to selected members under a revolving arrangement. They pool money as savings together and then lend this money to themselves (members) at an agreed upon interest rate. Unfortunately, VSLAs often are targeted to the acquisition of an item or savings amount by members and do not provide advisory and networking support to their members. This is an area that will need focus, especially through introductions and handholding the creation of new partnerships.

Figure 23. Business association participation rate

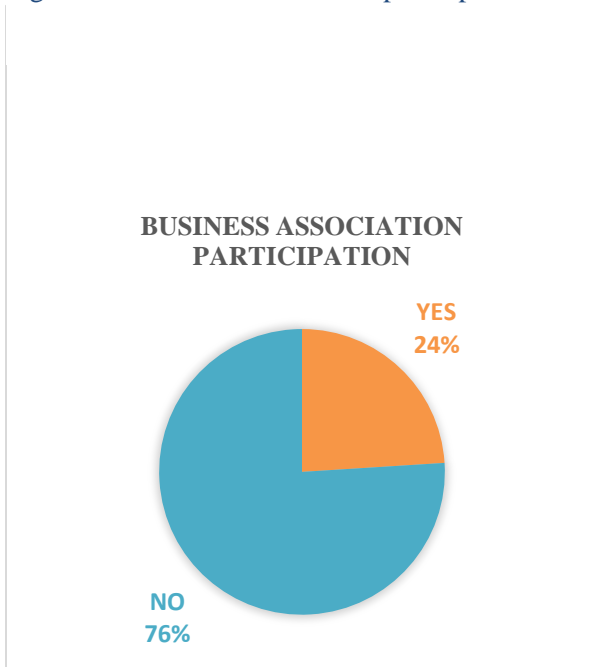
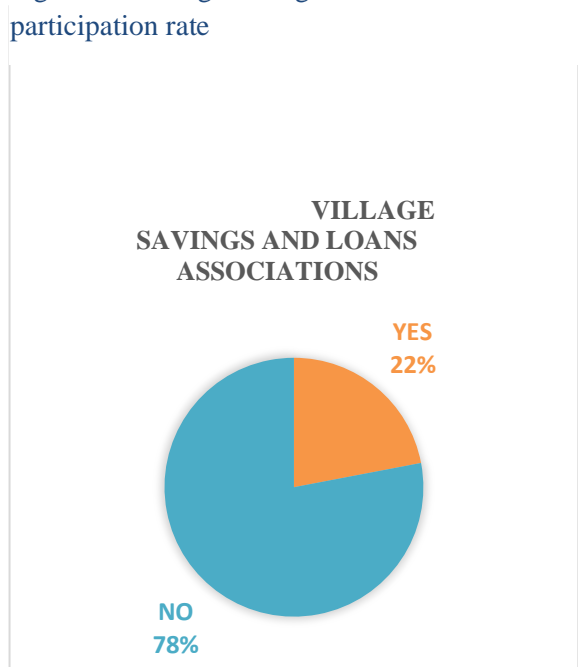


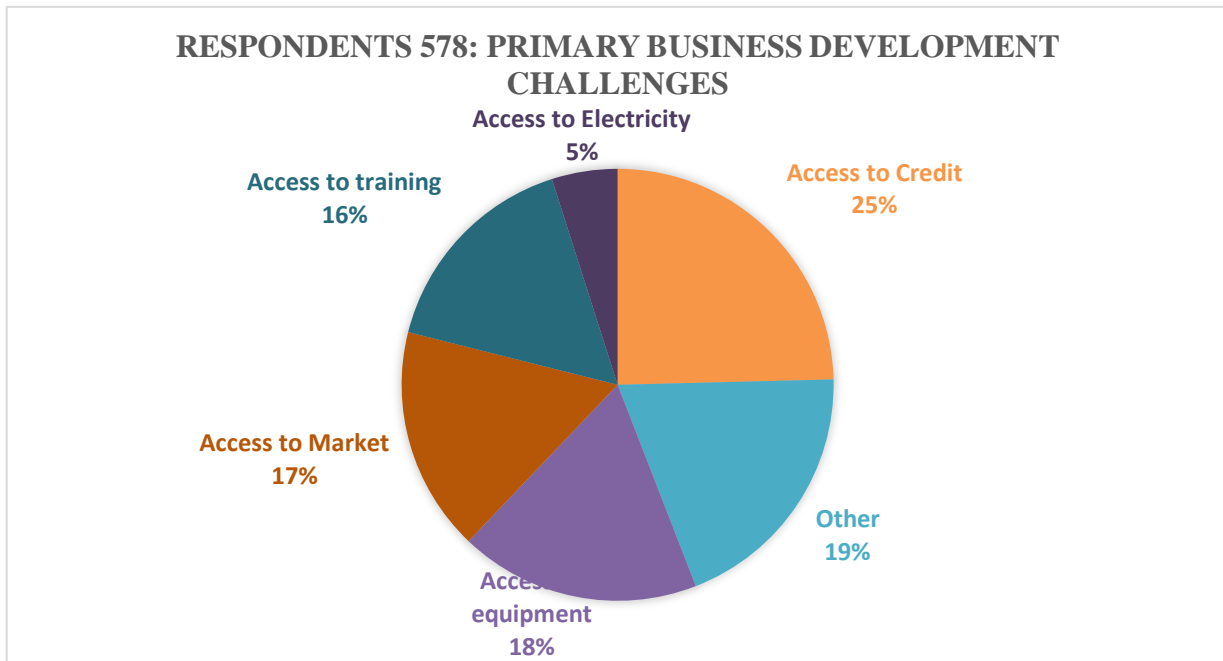
Figure 22. Village savings and loans association participation rate



Primary business challenges

Finding: For women entrepreneurs in Uganda the biggest challenge faced in running a EPUE business is access to credit (46%).

Figure 24. Primary business development challenges



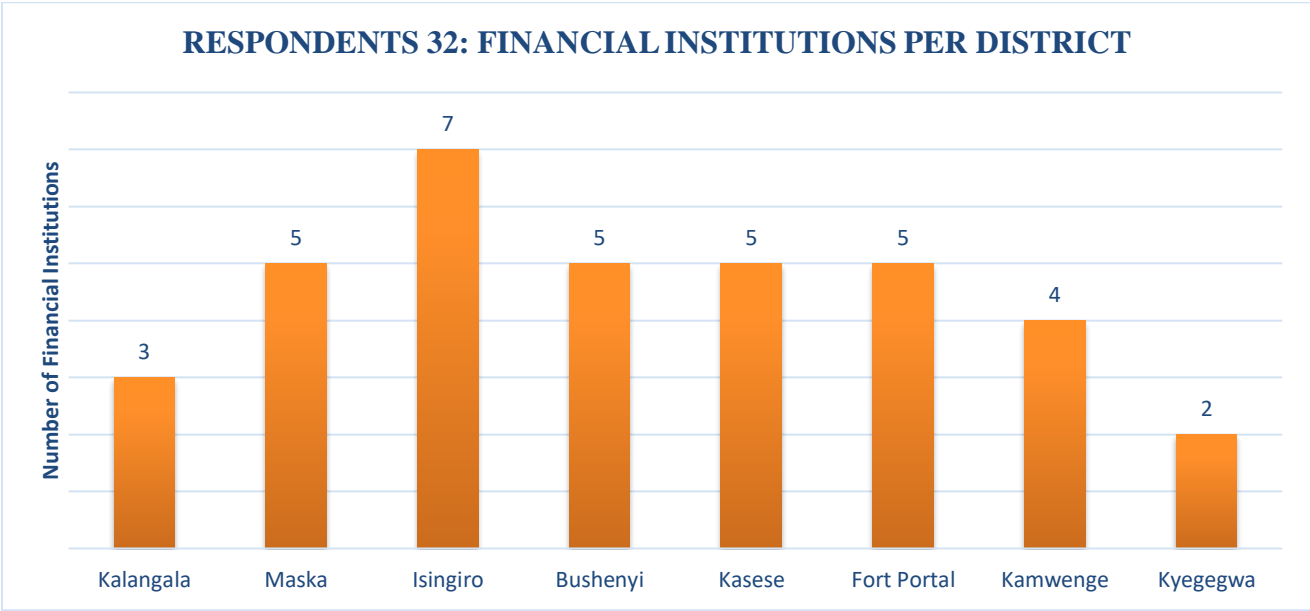
The survey also identified the challenges that women face when running their EPUE businesses (Figure 24). Other challenges highlighted include high taxes and local government fees, variations in input prices, and high electricity tariffs and among others¹.

Market access to financing

Financial Institutions

This section presents findings from engagement with financial institutions. The study team conducted 32 interviews with commercial banks, microfinance institutions, SACCOs, and VSLAs. The majority of respondents were from commercial banks (61%), as these are well capitalized and can finance different types of EPUE businesses, including equipment, with medium ticket size facilities. Other respondents were from microfinance institutions (25%), which are tier 3 financial institutions that do not have checking accounts; SACCOs (11%), which are savings and credit cooperative societies and are categorized as tier 4 financial institutions and are member owned; and VSLAs (1%), which are informal savings groups formed mostly at the village level. The financial institution respondents had historical and institution memory on EPUE and general energy financing: 72% of the respondents had worked with the financial institutions for over five

Figure 25. Number of financial institutions surveyed per district



¹ Uganda runs a decentralized form of government where administrative powers were devolved to the local levels. In addition to the national tax policy, local governments also levy own taxes, such as operating license fees.

years, while 22% had two to four years of banking experience. Figure 25 shows the number of financial institutions per district that were contacted.

Financing women entrepreneurs

Finding: Women entrepreneurs in Uganda have an opportunity to access capital from financial institutions (FIs), as about 92% of FIs target women in their lending strategies. About 61% offer energy access loan products.

Almost all the financial institutions reached (99%) confirmed that their main customers are involved in agriculture and trade. About 92% of the financial institutions target women in their lending strategies. For example, Centenary Bank has an energy access loan and a super woman loan facility. DFCU bank organizes women into groups and cooperatives to easily meet the application criteria for group lending, and offers reduced interest rates and financial literacy training for women.

About 61% of the financial institutions surveyed offer energy access loan products like solar loans, clean cooking loans, electricity connection loans, and EPUE assets financing. Specific to the latter, 86% of the institutions offer asset financing loans through which most EPUE equipment can be sourced. On average, these institutions receive 145 loan applicants in a month, of which about 36% are from women entrepreneurs. However, only 15% of the women applications are to finance acquisition of EPUE equipment. Table 15 shows the average range and the number of loan amounts taken out by women entrepreneurs in Uganda, all of which speak to the small size of the businesses under study.

Table 15. Loans statistics targeting women entrepreneurs

145 TOTAL NUMBER OF LOANS ISSUED A MONTH			
<i>Loans Targeting Women</i>		<i>Number of Loans a Month</i>	<i>% from the Total</i>
Loans to women entrepreneurs		37	26
Loans to women financing EPUE equipment		6	15
Average Loan Amounts Taken	Amount in US\$	Number of Loans (month)	From 37 in Total (%)
UGX 500,000-2,000,000	\$130-\$525	25	67
UGX 2,000,000-5,000,000	\$535-\$1,300	10	28

UGX 5,000,000-10,000,000	\$1,300-\$2,600	2	6
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On average, these financial institutions charge 27% per annum on interest, which is quite high for small and medium businesses, and 75% of the applications are turned around in three to five days. For those applications approved, the repayment period is one year (58%), two years (33%), and two to five years (8%). Table 16 lists a number of criteria considered when applying for a loan.

Table 16. Selection criteria for approving and declining applications

Selection Criteria for Approving/Declining the Financing Application	Top Five Reasons Identified for Declining Loan Applications from Women Entrepreneurs
<ul style="list-style-type: none"> • Collateral • Regularity of income • Credibility of the applicant • Business history • Existing savings • Presence of a business plan • Membership to a woman’s group/SACCO 	<ul style="list-style-type: none"> • Poor credit history • Insufficient collateral • Poor and/or inconsistent cash flows for the proposed business • High indebtedness of the applicant • Lack of or poor guarantors

When applications are approved, the most common EPUE equipment financed include refrigerators, salon equipment like hair dryers, sewing machines, millers, and milk coolers.

Barriers to women accessing finance

Survey findings identified both some of the barriers that women face when accessing credit and approaching financial institutions from the women perspective, and recommendations from the financial institutions themselves on how this engagement could be more successful (Table 17).

Table 17. Barriers and recommendations on how women can assess credit

Responses from Financial Institutions Identifying the Major Issues Affecting Women in Accessing Credit	Recommendations from Financial Institutions on Increasing Women Entrepreneurs’ Capacity to Tap into the Available Credit Products
<ul style="list-style-type: none"> • Difficulties in getting spousal consent and support 	<ul style="list-style-type: none"> • Train women entrepreneurs in basic business management skills such as

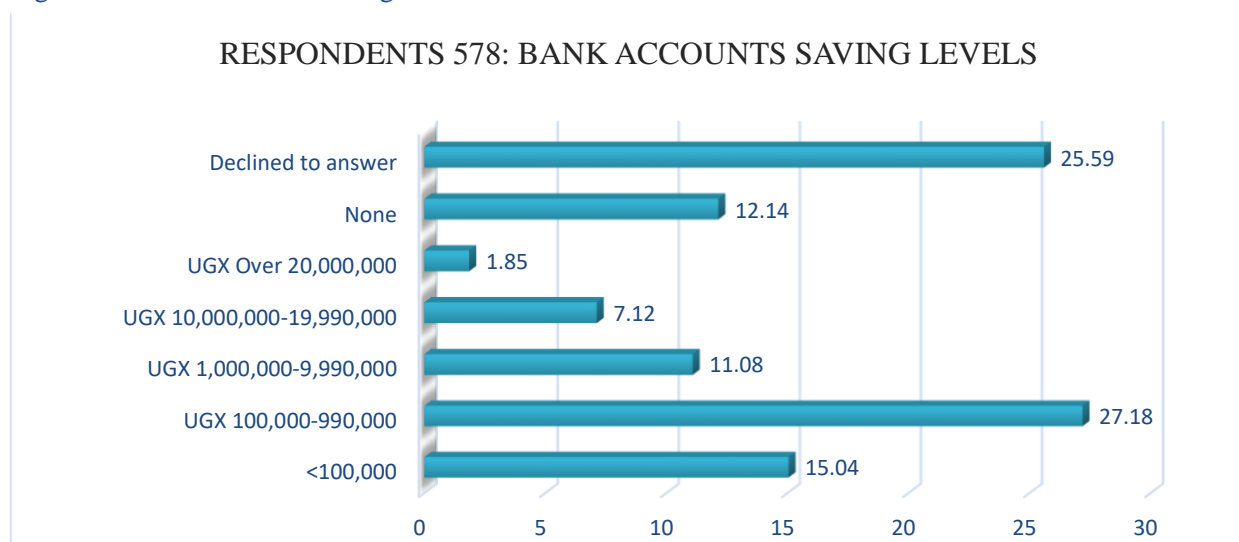
<ul style="list-style-type: none"> • Lack of collateral (most women do not have title to land, which is the most common type of collateral) • Limited knowledge of available credit products • Low literacy rates • Negative perceptions and attitudes to financial institutions (most women in focus group discussions would comment that they fear approaching banks in fear of losing their property/collateral) • Poor cash flows (due to poor recordkeeping and sometimes poorly performing businesses) • Insufficient savings base 	<p>recordkeeping, financial management, and enterprise management.</p> <ul style="list-style-type: none"> • Support financial institutions to educate women about available financial products. • Increase electricity access and reliability to increase local production and processing capacities. • Train women entrepreneurs on how to safely use electricity and equipment. • Support and engage with financial institutions to develop appropriate and tailored financial products that can support energy efficiency and EPUE.
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What businesswomen said

Finding: The majority of women entrepreneurs surveyed (66% of the respondents) have active bank accounts, with saving levels ranging up to UGX 1,000,000 (US\$271) for the majority of them (42.8%). Only 8.97% of them have a level above UGX 10,000,000 (US\$2,710).

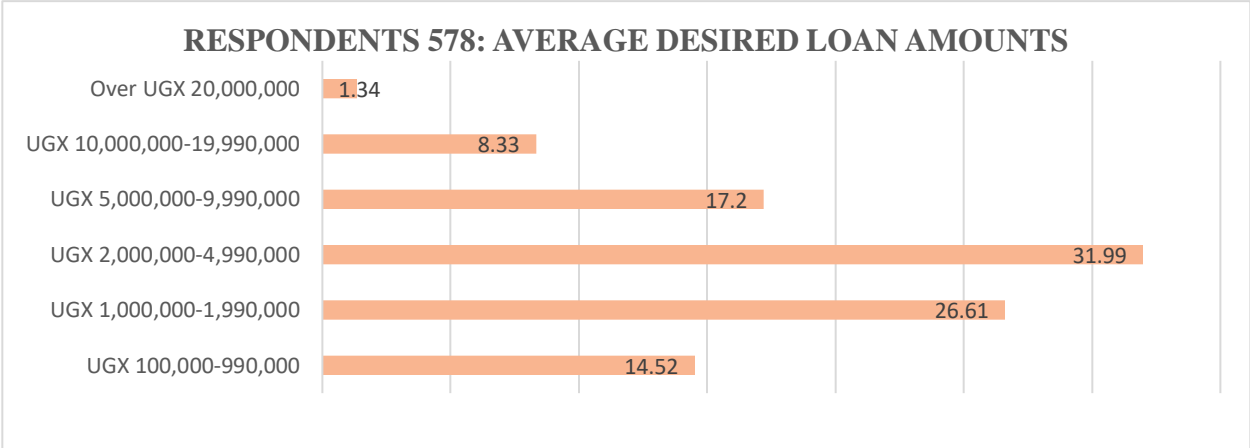
This section presents findings from interviews with women entrepreneurs. The survey found that 66% of the respondents (385) have active bank accounts; 84% of the accounts are held with commercial banks, while 15% are in SACCOs. The accounts have varying levels of savings, as shown in Figure 26.

Figure 26. Bank accounts saving levels



Even with the high number of women entrepreneurs holding bank accounts, the survey found a low loan penetration level. About 48% of the women entrepreneurs have never applied for a loan. Of those that have previously applied, 52% found the application process easy, 21% consider the interest rates to be high, 12% found the application process to be difficult, and 10% found the repayment process for the loan too difficult. Interestingly, 93% of the women entrepreneurs said that their gender has not affected their capacity to acquire a loan, implying the perception of a gender inclusive and transparent process for loan acquisition. The main factors presented when gender affects the acquisition of a loan are: (1) collateral requirements and (2) challenges in getting spousal consent. To support access to finance for women entrepreneurs in EPUE, it is important that the most bankable entrepreneurs are linked to financial institutions. The survey found a willingness from the financial institutions to leverage existing loan products, and 65% of the women entrepreneurs would consider getting a loan for their EPUE businesses. The loan amounts that women entrepreneurs are interested in getting is reflected in Figure 28.

Figure 27. Desired loan amount



Approximately, 70% of the women entrepreneurs have collateral that can be offered to secure and guarantee loan acquisition (Figure 28). The main sources of collateral women hold are business establishments (54%), land titles (26%), and existing equipment (19%) (Figure 29) Others include other assets like cars and gardens, which can be valued and used as collateral.

Figure 28. Collateral Ownership

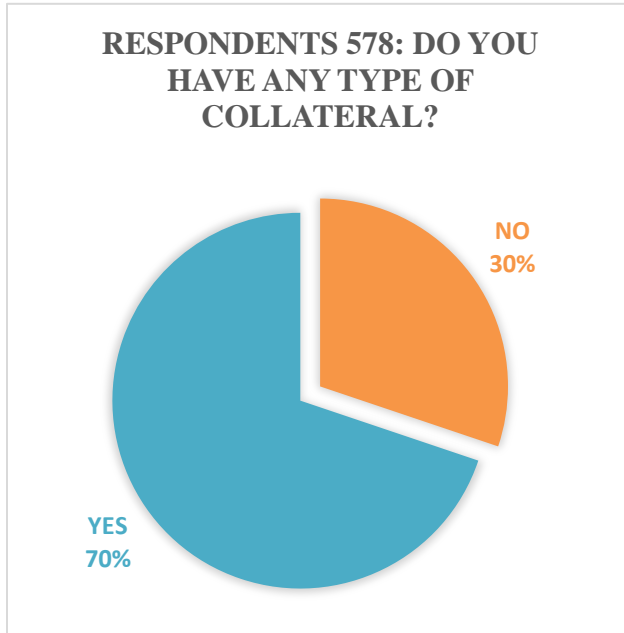
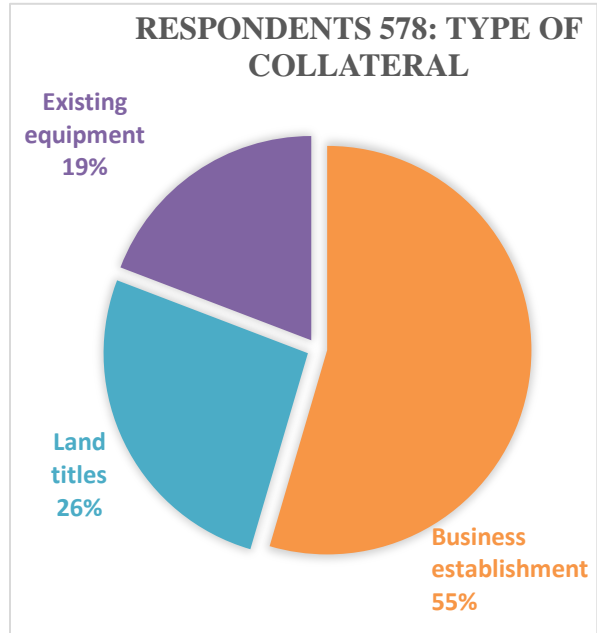


Figure 29. Collateral ownership by category



The 35% that are not interested in a EPUE loan gave the following reasons, in order of rank:

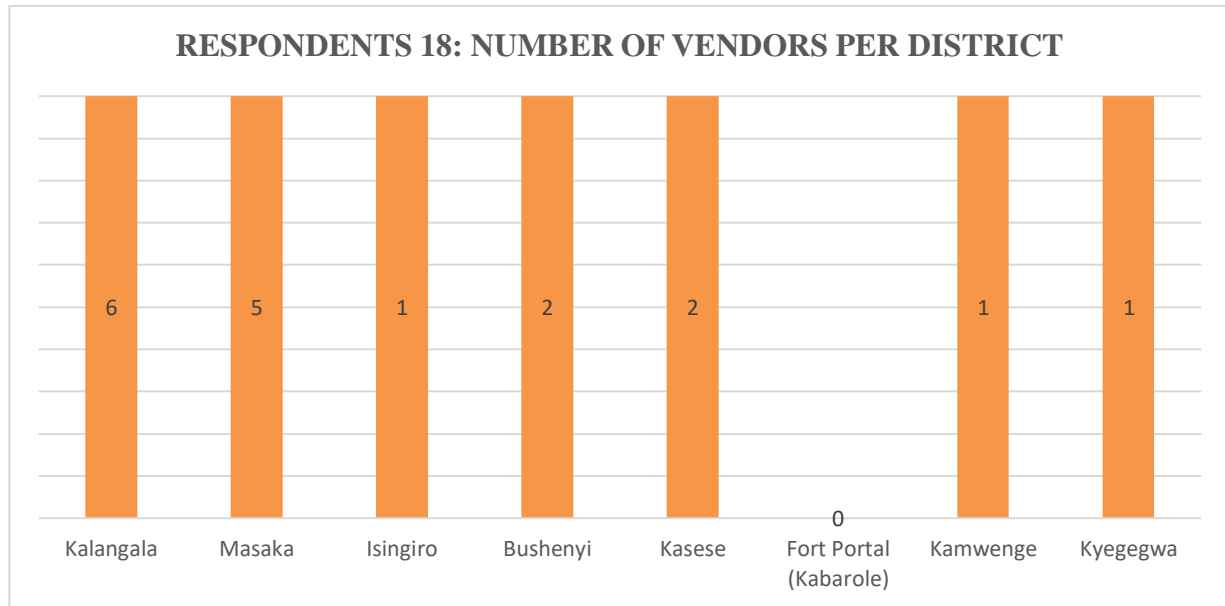
1. Repayment may be difficult (risk aversion)
2. High interest rates
3. Lack of collateral
4. Too many guarantees required by the financial institutions
5. Application procedure too difficult

Vendors

The survey reached 18 vendors from 7 districts (Figure 31). Over 30 vendors were approached for an interview, but most of them refused to participate for fear that their details could be used by the local and central governments to appropriate new taxes.

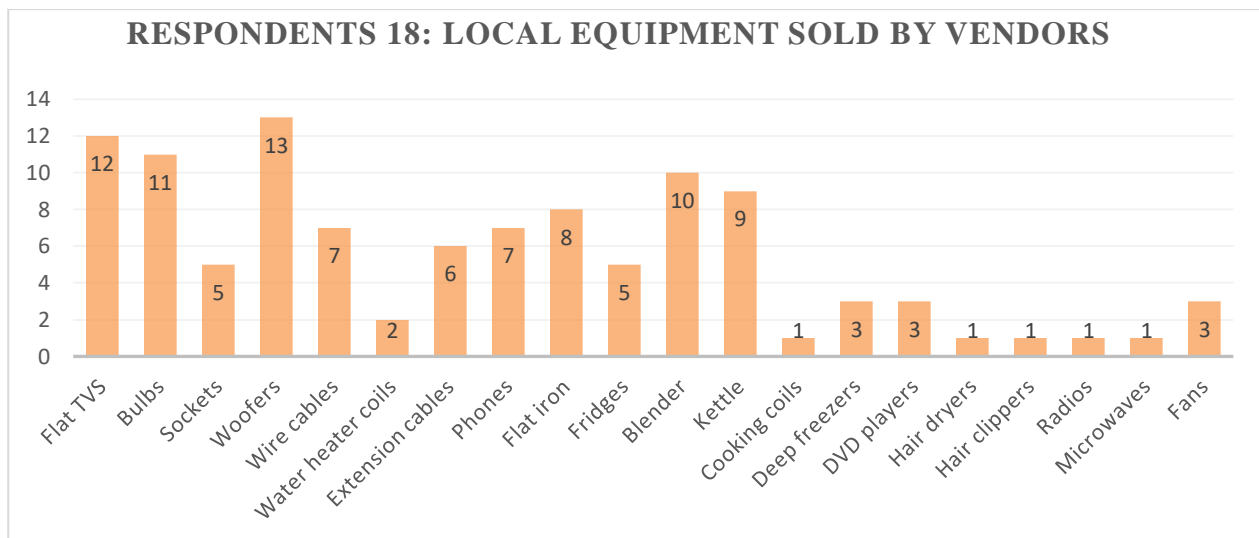
Figure 30. Number of vendors per district

Figure 31. Equipment type sold by local vendors



During the survey, the research team engaged with the 18 equipment vendors to determine what equipment they stock, demand trajectories, pricing, and financing options. Of the respondents, 56% were male and 56% had academic training in electrical installation, highlighting existence technical competences. Of the vendors, 89% had been in the business for more than one year. The major electric equipment sold is showing in Figure 32. All the vendors surveyed were selling new electrical equipment. At least 80% of the above appliances are manufactured in China; the remaining few are from Japan, UK, Korea, Germany, and Taiwan. The vendors source the above appliances mainly from Kampala, and for heavy equipment like refrigerators, these are often stocked on order and payment of initial installments. The existing equipment found in the

Figure 32. Local equipment sold by the surveyed vendors



businesses surveyed is old, and it is impossible to read their nameplates or labels to understand the energy rating.

All the vendors responded that the equipment sold has information on wattage, but information regarding energy rating is missing, speaking of a high need for energy efficiency labels. However, only 28% of them stated that customers consider the energy performance of appliances when buying. On the supply side, 56% (10 vendors) of the vendors consider the efficiency of equipment when stocking their products and 44% (8 vendors) do not. The latter, who do not consider energy efficiency while stocking inventory, attribute this to the end users not caring and most EPUE equipment being expensive and not in demand. Some customers have demand for refrigerators, electric cookers and ovens, printers, chandeliers, and coffee millers, but these are often not stocked due to the low demand in these areas. Of the vendors surveyed, 56% offer warranties of one month on average for radios, sound systems, televisions, and electric kettles, which is too short, and the maximum warranty period is 12 months, and only for equipment like refrigerators. Some of the power ratings/prices for the existing equipment are shown in Table 18.

Table 18. Equipment power rating/prices

Equipment	Power Rating (watts)	Energy Rating (kWh/unit)	Average Cost (UGX)	Average Warranty Period
<i>Woofer</i>	60-180	20	150,000	
<i>Blender</i>	350		180,000	None
<i>Bulbs</i>	4-45		5,000	
<i>Electric kettle</i>	1,500–2,200		40,000	
<i>Flat irons</i>	80		60,000	
<i>Television set</i>	60		300,000	1 month
<i>DVD players</i>	25		100,000	
<i>Chest freezers</i>		292	700,000	6 months to 1 year
<i>Microwaves</i>	1,200			
<i>Hand dryer</i>	1,800		80,000	1 month

Specific to women-run businesses, the equipment most demanded includes hair dryers, steamers, refrigerators, blenders and juice extractors, ovens, and entertainment equipment (like television sets and speakers), as the latter tend to attract more customers in restaurants, bars, and care and beauty salons. The major challenges faced by women in the acquisition of equipment are limited capital to purchase EPUE, limited knowledge of EPUE, poor quality equipment, transportation challenges, and high electricity tariffs, according to the vendors.

The adoption of EPUE technologies by women can be enhanced by the kind of technology transfer support provided by vendors. About 67% of vendors said they train end users on how to use EPUE equipment and provide installation and repair services for electrical equipment. To mitigate challenges regarding ability to pay, 78% of the vendors provide financing solutions, primarily by allowing staggered payments — this is the most common form of financing. Most of the vendors expressed interest in partnering with financial institutions to advance low interest credit facilities to groups and individuals who wish to acquire EPUE equipment.

A common observation during the interviews was that equipment vendors are often not keen to provide truthful information about the products they supply, like the quality of electrical appliances and guidance on efficient equipment in relation to efficiency ratings. In addition, sometimes they are not well equipped to effectively promote the products they supply from an efficiency and performance perspective. Besides price, for the vendor, the product is driven by demand rather than its efficiency (i.e., they usually make available their most popular equipment).

Some business opportunities for EPUE

The study identified a list of opportunities for EPUE, with a specific end-use application for promotion. Some of the opportunities are listed in Table 19.

Table 19. PUE business opportunity end uses

PUE EQUIPMENT/SECTOR	UTILIZATION
Fruit juice extraction	Powering extraction and packaging units
Apiculture	Honey extraction tapping into the flowers on the island through beekeeping
Essential oils extraction	Powering the centrifuge and the packaging units utilising the forestry on the island
Multipurpose community telecentres	Running computers, printers, photocopiers, secretarial and training services, etc.
Mobile phone charging and sale	Cell phone charging
Grain and cereal milling	Operating mills for rice, maize, millet, cassava, etc.
Peanut paste production	Power for the crusher for the peanuts and sesame seeds
Bakery and confectionery	Powering of machinery for confectionery
Milk cooling and processing units	Powering of machinery for the cooling of milk and making of ice cream, yoghurt, ghee, and butter
Hair salons	Powering shavers, warmers, sterilizers, steamers, and dryers
Entertainment centres	Powering TV sets, radios, public address systems, etc.

Tourism industry	Power for hotels, lighting, and increased hygiene (there was a lot of focus on the sale of refrigeration of cold drinks and refreshments)
Fruit and banana processing	Wine extraction and processing
Fish processing	Cold storage, drying/processing
Candle making	Powering the candle moulding machine
Poultry	Powering the poultry hatchery

6. Conclusions and Recommendations

Access to modern and reliable electricity is increasingly recognized as a prerequisite for improving living conditions and achieving sustainable growth in developing economies. Findings in this report call for an expansion of the energy access programs to include women-focused demand-side strategies, especially in the enterprise sector, to fully promote better access to the services that require electricity access beyond connectivity.

Women entrepreneurs in Uganda operate in small and less energy-intensive enterprises. They draw fewer benefits from electricity access programs, with lower electricity consumption trends — an average of 50 kWh consumption a month at the business level. The survey findings confirm that their energy access is limited due to a variety of barriers, hindering them from taking full advantage of existing or new trends emerging in the energy access field — crucially, efficient electric appliances that improve business performance. Some of these barriers include the following:

- Limited awareness of efficient and productive equipment
- High up-front costs and lack of initial capital to invest in equipment
- Lack of flexible financing that target the needs of women entrepreneurs
- High annual interest rates on loans
- Lack of information about the energy performance of the equipment sold
- Weak links between women entrepreneurs and equipment vendors
- Limited local distribution for last-mile users
- Lack of after-sales service, and long warranty coverage periods
- Distribution difficulties due to poor transport networks and limited communication infrastructure

Providing better access to lighting, refrigerating, cooking, and other productive uses of energy in women-run enterprises improves their benefits from deepening energy access to empowering them as active citizens in economic development. Survey findings confirm that businesswomen face multiple barriers to using energy for productive activities, from both a **knowledge gap** and a **market limitation perspective**. The extent to which barriers affect the business varies by type and business size, but there are similarities across all of them. The limited access to capital and the cost of electric appliances and equipment are significant barriers across all business sectors in Uganda. In terms of capital access, women entrepreneurs are either not creditable for a loan or are averse to debt. They lack business connections and technical and business development skills. At the same time, they are young and eager to learn and embrace new opportunities. They have limited awareness about most EPUE technologies but are aware of their business needs for equipment such as refrigerators, deep freezers, hair dryers, groundnut grinders, blenders, electric kettles, juice extractors and dispensers, electric sewing and knitting machines, and milk coolers, among others. Their existing equipment is often old, refurbished, and inefficient, and they would like to be trained

on business skills and energy management practices to better integrate buying and owning equipment with business practices. From a market access perspective, the current options offered are mostly old and refurbished electric appliances, and vendors lack the capacity to educate their customers. After-sales support and warranties for the equipment are often missing, as are energy efficiency and management guidelines.

Building a baseline with granular information on current practices in energy access for women entrepreneurs can guide decision-makers and practitioners alike towards better integrating demand-side energy management programs and stimulate activities that expand an energy accessibility framework in their programming. To increase entrepreneurs' gains from the use of electricity, these programs should include relevant end-use cases, information on equipment providers and financing mechanisms, energy efficiency guidelines, and any other relevant policies and programs in this space. More specifically, energy access programs should consider the following strategies to support the efficient and productive use of energy:

Bridge the knowledge gap

To address the knowledge gap that women face to better use electric equipment and develop their business, capacity building and educational/training efforts can be summarized as follows:

- Develop training programs that provide technical preparation and experiential learning opportunities for women entrepreneurs.
- Skills development for entrepreneurs should cover themes like energy use, business planning, and financial management.
- Develop corresponding manuals and guidelines, with stimulating visuals relevant to their context.
- Facilitate self-help network creation and business associations by providing seed funding or know-how on how to run organizations as needed.
- Use diverse dissemination outlets to increase awareness of EPUE technologies, including conventional and digital media outlets.
- Produce equipment catalogues with detailed information on the range of energy performance, productivity benefits, and associated costs.
- Conduct regular surveys to enable an ongoing understanding of the evolving dynamics that limit women entrepreneurs, to increase access to energy and design custom programs that best address their needs.

Address market limitations

Market limitations also hinder women entrepreneurs from benefitting from EPUE. The following activities could help to minimize or eliminate these limitations:

- Develop energy efficiency standards and labels at a national level to provide information about the energy performance of equipment that is easily understandable to users.
- Financial institutions should develop credit lines directed to women for investing in efficient and productive use of equipment.
- Financial institutions need to increase outreach and educate women on available financial products.
- Development practitioners and other stakeholders should organize matchmaking events that bring together EPUE equipment vendors, financing organizations, women entrepreneurs, government officials, women and entrepreneurial support programs, and funders.
- Electrification programs should include subsidy programs for particular groups to increase uptake of EPUE at a business level, including women entrepreneurs.
- Both public and private institutions, such as utilities and vendors, need to provide information on energy management and energy efficiency tips.
- Diverse stakeholders should join synergies and coordinate integrated awareness raising campaigns around electrification, where they can demonstrate the national economic opportunities of integrating women into energy access programs.
- Equipment sellers should introduce installment-staggered payment systems with zero or low interest rates.
- Public institutions, in collaboration with vendors, should strengthen and develop accountability mechanisms for after-sales care and equipment warranties.

To sum up, existing and future electrification programs should include the concept of demand-side energy access and stimulate economic activities that include tailored strategies for women entrepreneurs. Additional benefits can be unlocked by combining a strategy of bridging knowledge gaps with increasing opportunities for access to finance for procuring efficient and productive electrical equipment. For these entrepreneurs to become bankable and to access capital, they need to be trained in basic business management skills such as recordkeeping, financial management, and enterprise management.

Table 20. Summary of Survey Findings

Findings Summary	
Entrepreneur Profile	<ul style="list-style-type: none"> • <i>Women entrepreneurs in Uganda are young (34 years old average age) and have some educational background.</i> • <i>Women entrepreneurs in Uganda are mostly concentrated in the retail industry, owning small retail and commerce shops.</i> • <i>Women entrepreneurs in Uganda organize in business structures as sole proprietorships (84%).</i> • <i>Women entrepreneurs in Uganda have started their businesses in the last five years.</i>
Electricity Access	<ul style="list-style-type: none"> • <i>Women entrepreneurs in Uganda are connected to the grid and have had an established electricity connection for more than two years.</i> • <i>Women entrepreneurs in Uganda consume 50 kWh of electricity a month on average (~US\$13).</i> • <i>Women entrepreneurs lack information on the specific type of efficient and productive equipment that exist to develop their businesses.</i>
Productive Use of Electricity	<ul style="list-style-type: none"> • <i>Women entrepreneurs in Uganda recognize the benefits of electricity to grow their businesses and would like to acquire equipment such as refrigerators, deep freezers, hair dryers, groundnut grinders, blenders, electric kettles, juice extractors and dispensers, electric sewing and knitting machines, and milk coolers, among others.</i> • <i>Women entrepreneurs in Uganda use old and refurbished appliances in their businesses, which are highly inefficient increasing thus electricity costs, and repair because of frequent breakdowns. Much of the equipment has exceeded its lifetime and has been refurbished over time.</i>
Efficiency Considerations	<ul style="list-style-type: none"> • <i>About 54% of women entrepreneurs in Uganda have never done anything to save energy in their businesses besides reducing the number of hours they use their equipment. This is primarily because of lack of knowledge on energy saving tips.</i> • <i>Women entrepreneurs in Uganda have not been offered energy efficiency guidelines, and they lack energy management plans for their businesses.</i>
Business Skills	<ul style="list-style-type: none"> • <i>Women entrepreneurs in Uganda lack basic business and management skills, and 95% of them would like to receive support to develop a business plan.</i>
Access to Finance	<ul style="list-style-type: none"> • <i>Most businesswomen (66%) have commercial bank accounts, however loan penetration remains low. Almost half of the businesswomen (48%) have never applied for the loan.</i> • <i>Regarding financial institutions, 92% of them target women in their lending, and 61% offer energy access loans. About 86% of these institutions offer asset financing, where EPUE equipment belongs too .</i>

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