

# Women in Solar Energy: Managerial, Operational and Artisanal

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Prosperity House, Westlands Road,  
P.O. Box 4320, 00100, Nairobi, Kenya.  
Tel: +254 (0)20 271 0485

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ACE TAF extends its warm appreciation to the respondents who took valuable time from their busy schedules to participate in the key informant interviews and the online survey. Respondents represented a wide range of players from the Ugandan off-grid solar (OGS) sector including private sector companies, women, youth and persons with disabilities (PLWD) associations, academia, farmer groups, development partners and government agencies.

ACE TAF also appreciates the leadership of Joel Essien, ACE TAF Country Manager, Uganda; Isaiah Oonyu, Assistant Country Manager; Wanjiku Ngunjiri, ACE TAF Gender and Social Inclusion Advisor; Christine Butegwa, Senior National Gender Consultant; and Dr Mumbi Machera, Gender and Social Inclusion Advisor in compiling the findings for this report.

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## ABBREVIATIONS

<b>ACE TAF</b>	Africa Clean Energy Technical Assistance Facility
<b>CEO</b>	Chief Executive Officer
<b>COVID-19</b>	Coronavirus Disease of 2019
<b>CSBAG</b>	Civil Society Budget Advocacy Group
<b>DEEP</b>	Developing Energy Enterprise Project
<b>EACREEE</b>	East African Centre for Renewable Energy and Energy Efficiency
<b>EPRC</b>	Economic Policy Research Centre
<b>FCDO</b>	Foreign Commonwealth and Development Office
<b>GESI</b>	Gender Equality and Social Inclusion
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit
<b>GIZ</b>	German Corporation for International Cooperation
<b>GOGLA</b>	Global Off-Grid Lighting Association
<b>GoU</b>	Government of Uganda
<b>LWF</b>	Lutheran World Federation
<b>MEMD</b>	Ministry of Energy & Mineral Development
<b>NDPIII</b>	Third National Development Plan
<b>NHRDP</b>	National Human Resource Development Planning
<b>OGS</b>	Off-Grid Solar
<b>PAYG</b>	Pay-As-You-Go
<b>PLWD</b>	People Living With Disabilities
<b>SAS</b>	Stand-Alone-Solar
<b>STEM</b>	Science, Technology, Engineering and Mathematics
<b>UBOS</b>	Uganda Bureau of Statistics
<b>UGX</b>	Uganda Shillings
<b>UNCDF</b>	United Nations Capital Development Fund

## EXECUTIVE SUMMARY

The overall objective of this study was to investigate the role played by women, youth and persons living with disabilities (PLWD) within the SAS energy value chain in Uganda. Specifically, the study was aimed at ascertaining the extent to which these groups are involved in the off-grid solar (OGS) energy value chain at managerial, operational and artisanal levels. By identifying the levels of inclusivity, the study aimed at assessing the extent to which women and marginalised groups, particularly youth and PLWD, are able to access opportunities along the value chain. Although there is some global and Ugandan literature on women's participation in the OGS value chain, there are limited studies on youth participation and even much less information on PLWD. This study sought to address this knowledge gap.

### Methodology

The study used a mixed method approach. An online survey was conducted with 200 respondents who were identified with the assistance of OGS companies to acquire quantitative data. A total of 23 key informant interviews were conducted with representatives from private solar companies, women, youth and PLWD associations, academia, farmer groups, development partners and government agencies for acquisition of qualitative data. Secondary data was obtained through a comprehensive literature review.

The survey response rate was quite low, therefore most of the results reported here are from qualitative and secondary data sources. The low response rate in the survey was due to the fact that the study was conducted between December 2020 and February 2021 in the midst of the COVID-19 pandemic. There was also the internet shutdown during and after the elections in January 2021, and persistent slow internet connections a month after the elections that adversely affected data collection and analysis.<sup>1</sup>

### Study findings

- Gender equality and social inclusion (GESI) responsive policies, access to capital and training are key to women's meaningful participation in the OGS value chain.
- While there are OGS entities that have policies targeting inclusion of women in the value chain, none have policies targeting PLWD.
- Most OGS distributors have registered a 1:1 male-female ratio in the sales departments. This means women are as likely to be employed in sales and marketing departments of OGS companies as men.
- Most OGS technicians are male, mainly based in rural areas. For most companies, it is easier to get men as technicians because they have the requisite training and have attained a higher level of education in science, technology, engineering and mathematics (STEM).
- Women are likely to feel more comfortable marketing and selling OGS products in urban areas where social and cultural norms and values have significantly changed.
- In the rural areas, there are more men selling OGS products than women. This disparity could be influenced by gender stereotypes that are still higher in rural areas compared to urban areas.
- Most OGS companies have no PLWD employees, only a few are employed as support staff. The study did not find any PLWD in artisanal or managerial positions.
- There are very few women in managerial positions. For example, there are only three female chief executive officers (CEOs) out of 200 solar companies in Uganda.
- Most interviewees felt that government should implement existing gender mainstreaming policies to ensure an increase in the number of women, youth and PLWD in future tenders in mini-grids and off-grid energy projects.

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1. High Internet data costs also contributed to the low response from the online survey.

- ☉ Most people perceive the involvement of women in the OGS value chain, especially as technicians, as counter to the socio-cultural norms. At the individual level, women are perceived as lacking information, training and skills to effectively engage in the OGS value chain.
- ☉ The perception that the solar industry is a male domain needs to be deconstructed. Some pacesetters, such as Winch Energy, are using women technicians and also engaging them in energy communication and awareness raising.

## Recommendations

### Conduct GESI trainings for OGS companies

Support should be provided to OGS companies and energy related government institutions for GESI capacity development. This should include awareness raising on gender, PLWD and employment legal frameworks. The players should be supported to mainstream GESI through development of gender, human resource and other policies and strategies. Building skills in gender analysis, planning, auditing and monitoring and evaluation is also necessary.

### Train female users to become sales agents

Build on successes like Solar Sister to train and turn OGS users into sales agents. More women, youth, PLWDs can be supported to be early OGS users so that they can transition into agents. On the other hand, support can be provided to businesswomen in other sectors to bring them into the OGS value chain. For example, the United Nations Capital Development Fund (UNCDF) has found that women entrepreneurs with no expertise in solar can enter the solar market with the right incentives.

### Strengthen women's mentorship along the OGS value chain

Support the development of girls' and women's mentorship programmes in partnership with schools, vocational institutes and solar companies to encourage more girls and young women to take up STEM and OGS technical training. Further GESI research should be conducted on barriers and opportunities in the OGS value chain where there are few women artisans, technicians, entrepreneurs of large OGS enterprises and top management.

### Initiate gender sensitive approaches to encourage girls into vocational institutes

Vocational institutes can be supported to encourage girls to take STEM courses much earlier, for example lower secondary or primary school level. More investments should be made in organising school career fairs so that girls and young women can be encouraged to join STEM. Textbooks should be continuously updated and be more gender sensitive. Finally, more scholarships for girls and young persons with disabilities to study the technical courses should be provided. Further studies should be conducted to examine and address the barriers to girls' uptake of government scholarships in vocational institutes.

### **Government should take lead in promoting GESI in OGS value chain**

Government can provide leadership for private sector and other stakeholders to promote GESI in the OGS value chain. For example, government can initiate and/or implementing a policy that encourages future tenders in all energy projects to ensure representation of women, youth and PLWD. Additionally, local content should have a gender and/or age quota.

### **Need for specific funds to promote GESI in OGS sector**

There is need for specific funding focusing on gender initiatives in the solar sector. This would build on initiatives like UNCDF, which has provided funding to OGS companies to conduct gender inclusivity audits, produce gender recruitment strategies and do peer-to-peer learning. UNCDF plans to establish specific financing to improve gender equality in energy businesses, especially supporting women-run businesses to integrate OGS in their business models.

### **Develop incentives to encourage OGS companies to promote GESI**

Currently, GESI integration in OGS companies is very much donor driven. There is need to support companies to own the processes of mainstreaming and implementing GESI initiatives. For example, companies can be encouraged to take advantage of government tax refund incentives for those that employ PLWD. The human rights and business case for GESI needs to be promoted by the private sector.

### **Develop case studies on what works on GESI in OGS**

There is need to produce best practice case studies on what has worked for women, youth and PLWD at each level of the OGS value chain. Having examples on what has worked and the benefits of gender mainstreaming in solar businesses has enabled some OGS companies and development partners to promote participation of women.

### **Capacity building of women's organisations on energy for GESI accountability of OGS sector**

Enhance the capacity of gender experts and women's organisations in the energy sector to improve their knowledge of OGS, including the value chain, so that they can hold energy sector actors accountable for women's participation in the sector.

### **Build database of women, youth, PLWD in OGS value chain**

Compile a database of women, youth and PLWD in the OGS value chain including artisans, suppliers and managers. Additionally, support stakeholders to conduct gender impact assessments of all projects through monitoring and evaluation

### **Initiate gender scorecards in OGS companies**

Private sector agencies should be held accountable for implementing gender equality actions through creating and implementing gender scorecards as part of their corporate social responsibility (CSR).

# 1 BACKGROUND INFORMATION AND RATIONALE OF THE STUDY

## 1.1 Background Information

Gender equality and social inclusion (GESI) integration in the off-grid solar (OGS) sector is the process of ensuring the concerns of women and men from all social groups (ethnicity, caste, economy, age, disability, geographic locations, etc.) form an integral part of design, implementation, monitoring and evaluation of policies and programmes in the sector. The overall aim is to promote equality of opportunity, power and decision-making between women and men by addressing barriers in access and control over resources, information, opportunities and decision-making power.<sup>2</sup>

The Uganda Vision 2040 and the Third National Development Plan recognise energy as a critical driver of socio-economic transformation. To ensure universal access to affordable, reliable and modern energy services, the Government of Uganda (GoU) is committed to scaling up investments in the requisite human resource capacity, to reduce electricity costs, and to expand rural electrification and the use of renewable energy sources, particularly solar and biogas.<sup>3</sup> Although Ugandans aspire to live in a society where women and men are empowered to participate as equal partners in the country's development, gender gaps continue to exist in all sectors, including the energy sector.

The global market for OGS has grown rapidly in emerging markets over the last decade. However, with almost one billion people worldwide lacking access to a reliable electricity connection,<sup>4</sup> OGS sales have only attained around 17 per cent of the global potential market,<sup>5</sup> leaving a vast potential market unattained and, correspondingly, a vast potential for employment creation. The OGS sector has already spurred a range of new job opportunities and can continue generating thousands more if this potential market is realised.

This report examines the level and nature of employment opportunities generated by the OGS sector, and how this employment is projected to grow and change as the market evolves. It then sets out a conceptual framework to capture the wider benefits that could be generated by employment created in and beyond the OGS value chain.

Women's involvement in the SAS value chain beyond sales in Uganda has not been explored in detail and there is need to identify more job opportunities for women in the solar energy value chain. In 2018, GoU expressed interest in promoting productive use of energy (PUE) as a strategy to increase energy access and enhance rural livelihoods, particularly through solar irrigation. Notably, approximately 75 per cent of small-holder farmers in Uganda are women, and thus any enhanced uptake of solar irrigation is likely to positively impact rural farming households and women's incomes. However, there has not been an examination of the role that women and girls play at the various levels of the OGS value chain and the opportunities that exist for them to participate.

This study provides the public sector in general and the Ministry of Energy and Mineral Development (MEMD) in particular, with evidence for consideration in designing gender strategies to support last-mile energy access to vulnerable communities during the implementation of the Draft Energy Policy 2019 currently before Cabinet. The study can also be used to guide public, private and development partner decision-making to improve women, girls' and PLWD's livelihoods through more gender-sensitive and inclusive job opportunities in the green energy sector, ultimately accelerating access to OGS solutions for all.

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2. Government of Nepal, Ministry of Science, Technology and Environment, Alternative Energy Promotion Centre (2014). *Gender equality and social inclusion toolbox: Promotion for renewable energy technologies.*

3. Mpagi, J. & Kooijman, A. (2020). *Gender and energy country briefs – Uganda.*

4. IEA (2018). *World Energy Outlook.*

5. GOGLA (2017). *Global Off-Grid Solar Market Report Semi-Annual Sales and Impact Data.*



Given ACE TAF's mandate to facilitate energy access to vulnerable communities, this study contributes to improving the livelihoods of women, youth and PLWD by identifying job opportunities in the OGS value chain. The study provides evidence to guide gender-inclusive decision making among both private and public sector actors in the solar sub-sector.

## 1.2 Study Objectives and Methodology

The overall objective of this study is to highlight the role played by women and youth in the SAS energy value chain within Uganda. By encouraging the creation of job opportunities to women, youth and PLWD, ACE TAF expects that not only will the livelihoods of the families be improved, but it will accelerate access to OGS solutions for all.

The study also aimed to ascertain the extent to which the solar energy value chain at managerial, operational and artisanal levels is inclusive, and to identify job opportunities for women and marginalised groups. In addition, the study assessed the role of women, youth and PLWD in the different levels of the Uganda OGS value chain, the barriers and opportunities for them and identified the variety of sex-disaggregated data on women's participation in the OGS value chain available in Uganda.

The study utilised a mixed method approach to obtain and triangulate data. A comprehensive literature review was undertaken, with key documents obtained from ACE TAF, energy research institutions and relevant public domains. Additionally, key informant interviews were conducted with 23 respondents representing solar private sector companies, women, youth and PLWD, PLWD associations, academia, farmer groups, development partners and government agencies. A survey was conducted online with over 200 respondents, mainly through solar and farmer groups.

## 1.2 Study Limitations

There were two key limitations:

1. The study was conducted between December 2020 and February 2021 in the midst of the global COVID-19 pandemic. Measures to combat the pandemic prevented the organising of focus group discussions due to restricted physical interactions. Instead, the study relied on online surveys to collect quantitative data, which received very low responses due to a number of factors. This included the internet shutdown during and after the elections in January 2021, and slow internet connections a month after the elections during the data collection and analysis stages.
2. High Internet data costs that contributed to the low response from the online survey.

## 2 STUDY FINDINGS

This section presents findings drawn from secondary data. Evidence has been gathered from most recent sources of secondary data on OGS. The sources have provided global, regional and national insights into the OGS value chain. The data and insights have been synthesized to correspond to the key questions of this study.

### 2.1 Off-Grid Solar in the Global Context

The OGS industry is generating thousands of employment opportunities in emerging markets. These opportunities have crucial impacts on individual livelihoods, rural and urban development, and on other sectors of the economy. Across East, West and Central Africa, and across South Asia, it is estimated that the OGS sector currently supports 370,000 fulltime equivalent (FTE) jobs. South Asia accounts for around 260,000 of these jobs, representing the largest market for employment among the four regions.<sup>6</sup> These employment opportunities are driven by a large volume of sales that are expected to maintain a strong growth trend in coming years. GOGLA estimates that by 2022, the OGS sector could support up to 1.3 million FTE jobs across these four regions.

South Asia will remain the largest market for employment, accounting for 740,000 FTE jobs, largely driven by an increase in the volume of cash-based SAS technology sales. As the second largest market, East Africa will account for 350,000 FTE jobs predominantly generated by the rapid and ongoing growth of the pay-as-you go (PAYG) service delivery model in the region.

Table 1: Distribution of projected job market for the OGS sector by 2022

Region	East Africa	West Africa	Central Africa	Asia
Gross jobs	350,000	150,000	67,000	745,000
Management	12%	11%	10%	14%
Acquisition/Manufacturing	5%	5%	5%	2%
Sales and distribution	57%	58%	61%	64%
Installation and maintenance	19%	18%	16%	16%
Customer Support	7%	7%	8%	4%

Source: GOGLA

Note: Jobs shown are FTE. The total number of jobs created is therefore much larger than this.

The value chain for SAS products is international – sales in one region will generate employment both in that region and in other regions. For example, manufacturing of components often takes place in a different location from assembly or sale of the final product – and the organisation of the supply chain will differ from one region to another in this regard. In East Africa, employment across the value chain is expected to rise from 75,000 in 2018 to 350,000 in 2030. East Africa is already a large market, with a relatively large proportion of PAYG sales. These PAYG sales are projected to make up 62 per cent of total products sales in the market by 2022, with cash sales comprising only 38 per cent. This large proportion of PAYG sales is expected to help drive this strong increase in employment opportunities.

6. GOGLA (2020). *Off-grid solar: A growth engine for jobs*.



Table 2: Summary of pico and plug-n-play 2018 and 2022 sales (projected) by region

	East Africa	West Africa	Central Africa	Asia
	Cash sales	PAYG Sales	Cash Sales	PAYG Sales
East Africa	5.4	2.4	7.6	12.2
West Africa	1.8	0.6	2.7	3.4
Central Africa	1.1	0.1	1.9	1.3
South Asia	10.3	0.2	21.9	4.4
Total	18.6	3.3	34.1	21.3

Source: GOGLA

The OGS sector is generating a wealth of new employment opportunities across the value chain, ranging from entry-level to high-skilled positions. The scale and nature of these jobs will continue to evolve. Technological innovation will also drive an expansion in job opportunities, with larger SAS systems supporting a wider range of complex consumer goods.

## 2.2 Energy Situation in Uganda

Half of Ugandan households (51 per cent) access at least one form of electricity, with 24 per cent using grid electricity (64 per cent in urban areas). Slightly more (27 per cent) rely on off-grid electricity (33 per cent in rural areas).<sup>7</sup> Renewable energy accounts for 90 per cent of the total installed electricity generation capacity. In 2018, this amounted to 984MW. Of the total generated, hydro (large and micro) made up 75.6 per cent, thermal plants 10.3 per cent and solar 4.1 per cent.<sup>8</sup> Domestic users consume 92 per cent of electricity generated while commercial, industrial and street lighting account for 8 per cent (UBOS ERT III, 2018).<sup>9</sup>

To increase energy access, the GoU has set a target of achieving 100 per cent access to clean energy by 2035 (Uganda Vision 2040). In the medium term (2020–2025), Uganda is committed to increasing the proportion of the population with access to grid electricity from 24 per cent to 60 per cent. It also aims to strengthen the supply side to provide stable and reliable electricity with outages reduced to 10 per cent. With increased solar usage, the use of canister-wick lamps (kerosene) declined from 58 per cent to 28 per cent between 2013 and 2017. Further, Uganda intends to reduce the share of biomass energy in cooking from 85 per cent to 50 per cent and, correspondingly, increase the proportion using clean energy for cooking from 15 per cent to 50 per cent. As part of this, Uganda is promoting the uptake of alternative and efficient cooking technologies including electric cooking, domestic and institutional biogas and liquid petroleum gas (LPG). The following chart shows the proportion of households accessing energy by source of lighting. Remarkably, solar contributes to lighting 22% of the households compared to 18% from grid electricity.

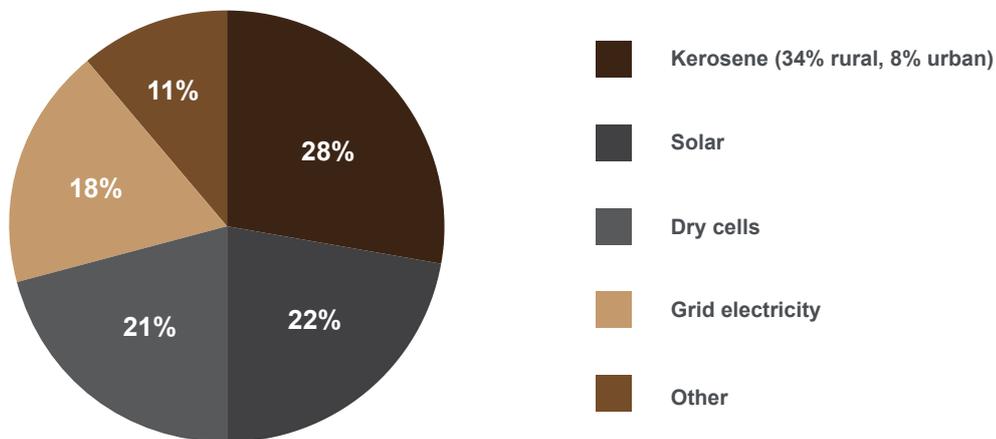
7. Uganda Bureau of Statistics (2018). *Energy for Rural Transformation (ERT III) Survey – Uganda*.

8. Uganda Bureau of Statistics (2018). *Energy for Rural Transformation (ERT III) Survey – Uganda*.

9. Uganda Bureau of Statistics (2018). *Energy for Rural Transformation (ERT III) Survey – Uganda*.



Figure 1: Distribution of households by energy source in Uganda<sup>10</sup>



### 2.3 Employment in the Energy Sector: National Policy Framework

The National Development Plan (NDP) III for the period 2020/21–2024/25 places job creation, value addition and productivity at the centre of Uganda’s development over the next five years. This is highlighted in Objective 2: Strengthen private sector capacity to drive growth and create jobs; Objective 3: Consolidate and increase the stock and quality of productive infrastructure; and Objective 4: Enhance the productivity and social wellbeing of the population.

In relation to the OGS value chain as a viable avenue for job creation, the enabling strategies provided by NDP III are an opportunity. Specifically, NDP III provides a framework for private sector, development partners and communities to direct investments towards “increased generation of more skilled, better motivated, and healthier workforce for all sectors of the economy...” NDP III prioritises the reformation of “youth and women employment programmes” to promote employment.<sup>11</sup> Of note is that the government will prioritise skills and vocational development to address youth unemployment, including reviewing its Skilling Uganda Strategy.

In line with Uganda Vision 2040 policy aspirations on developing competitive human resource to drive development in identified sectors, the first ever five-year National Human Resource Development Planning Framework for Uganda (NHRDP), 2018, was developed by government to accompany the NDP III to streamline the attendant human resources needed to achieve the plan. The NHRDP was developed to respond to the “persistent rise in the mismatch of labour market requirements experienced through increasing unemployment, underemployment and disguised employment...” Specifically, the plan will aim to create a conducive environment to support job creation in the private sector (including OGS) ...” along the value chains in the quest to produce highly skilled, well educated, competent and productive citizens”.

10. Mpagi, J. & Kooijman, A. (2020). *Gender and energy country briefs – Uganda*  
11. NDP III 2020/21–2024/25





The NHRDP describes the value chain approach as “focusing on building a well-balanced human resource that is healthy, educated, and properly skilled in a concerted effort of all socio-economic transformational stakeholders in different branches of government, private sector and the civil society”. The plan points to significant challenges in the labour market of the country, including undeveloped labour market data for capturing and guiding planning of HR trends, and persistent youth unemployment that points to failure to harness the demographic dividend. The plan aims to expand the pool of Ugandan entrepreneurs, business leaders, managers and professionals.

The NHRDP is aligned to GESI and sets out the role of the Ministry of Gender, Labour and Social Development (MGSLD) to be to “enhance the resilience and productive capacity of vulnerable persons for inclusive growth; empower youth to harness their potential and increase self-employment, productivity and competitiveness; promote rights, gender equality and women’s empowerment through skills development processes; and reduce imbalances and improve access to opportunities for all”.<sup>12</sup>

The Draft Energy Policy 2019 recognises the challenge of shortage of skilled manpower along the energy value chain as an impediment to efficient and sustainable energy management. Key strategies that the government will use to address this challenge include establishing and strengthening coordination at district/local government level to support the promotion of clean energy investments at the lowest levels; train and retain local human resource for the energy sector through effective capacity building and appropriate incentives; integrate energy studies into curricula of educational institutions, especially technical and vocational institutions; promote the development of appropriate local capacity for installation, maintenance and operation of basic renewable energy technologies; mainstream gender into energy sector activities and programmes to enhance the contribution of women in innovations and technologies for clean energy access.

## 2.4 Women and the Youth in the Labour Market in Uganda

The productive age population (14–64 years) in Uganda is about 19.2 million out of the estimated 37.7 million people in the country.<sup>13</sup> The working population is spread across different industries mainly agriculture, forestry, fishery, trade, manufacturing, transportation and storage. There are more men than women engaged in most paid economic activities.

Agriculture, forestry and fisheries are the major employers irrespective of gender, followed by trade. Men dominate in agriculture (56 per cent men to 46 per cent women), construction and manufacturing, while there are more women in the service sector (80 per cent) compared to men (20 per cent).<sup>14</sup>

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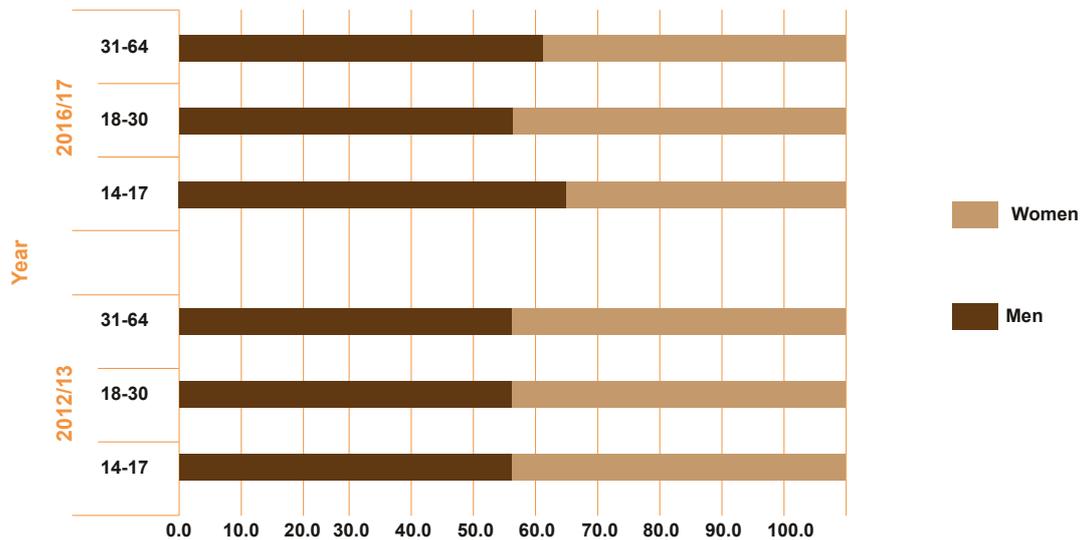
12. NHRDP 2018

13. UBOS, UN Women, Civil Society Budget Advocacy Group, Economic Policy Research Centre (2019). *Gender issues in Uganda: Gender-based violence, asset ownership and employment*.

14. *ibid*



Figure 2: Percentage distribution of economically active population by age-group and sex, 2012/13 and 2016/17



(Source: UBOS, UN WOMEN, CSBAG, EPRC, 2019)

Women tend to work in jobs that have less risk, are in the informal sector due to flexible work hours that consider their multiple social roles and time poverty, and have fewer barriers to entry, for example lower credit requirements. The unemployment rate was 5.8 per cent among men compared to 4.3 per cent among women in 2016/17, although it increased for women between 2012/13 and 2016/17.

Youth, defined as those aged 15–30 years old, make up the highest population of the underemployed in Uganda at 63 per cent. Three out of four youths in the labour market are self-employed. Among these, 50 per cent are own account workers, 21 per cent are family workers who are unpaid and 3 per cent are employers.<sup>15</sup>

A school-to-work transition survey found that the higher the educational attainment, the more likely a young person was to complete his/her transition to stable/satisfactory employment. There was an increase of youth with no education or leaving education before completion from 51.3 per cent in 2013 to 57.3 per cent in 2015, with more of these being young women.<sup>16</sup> This disparity by sex may be due to high teenage pregnancies and early marriage (25 per cent), which are some of the factors that affect girls' completion rates. Furthermore, the share of young women (18.6 per cent) neither in employment nor education or training is three times higher than of young men (6.6 per cent).<sup>17</sup>

Agriculture (57.2 per cent), the service sector (32.1 per cent) and industry (10.9 per cent) employ the majority of youth. More than 90 per cent of youth are in the informal sector or informal employment. Very few youth are employed in the electricity, gas and steam sectors with men making up 0.3 per cent and women making up 0.2 per cent in 2015.<sup>18</sup>

15. *ibid*

16. *Disability Act of Uganda.*

17. Nyombi, C. & Kibandama, A. (2014). *Access to employment for persons with disabilities in Uganda. Labour Law Journal.*

18. *ibid.*





**Table 3: Summary of key design elements for successful youth entrepreneurship programmes**

Key design elements	What seems to work as per evidence
Type of Intervention products	<ul style="list-style-type: none"> <li>⊗ Short training delivered in isolation yields little effect.</li> <li>⊗ Providing a comprehensive package of training, financing and business development services is more than standalone programmes.</li> <li>⊗ In-kind grants perform a better than cash grants.</li> <li>⊗ Loans generally perform better than grants.</li> <li>⊗ The effects of loans is greater when combined with training.</li> </ul>
Targeting Mechanism	<ul style="list-style-type: none"> <li>⊗ Business training seems to work better for existing businesses by improving their business knowledge, whereas vocational training may have a stronger effect on potential entrepreneurs.</li> <li>⊗ In cases where interventions target both males and female, the effects tend to be stronger for the males.</li> </ul>
Length of exposure	<ul style="list-style-type: none"> <li>⊗ Longer trainings have longer-term effects than short training periods.</li> </ul>
Delivery Channel	<ul style="list-style-type: none"> <li>⊗ Involving the private sector in the program delivery of public intervention can enhance the effectiveness. This can be in form of public private partnership.</li> <li>⊗ Demand-driven trainings perform better than supply-driven trainings.</li> </ul>
Delivery Setting	<ul style="list-style-type: none"> <li>⊗ Apprenticeships/on-job training and longer training result in stronger labour market outcomes than classroom-based and shorter programmes.</li> <li>⊗ Experimental and action oriented training yields a stronger effect.</li> </ul>

(Source: EPRC, 2015)

## 2.5 Persons Living with Disabilities (PLWD) in the Labour Market in Uganda

Disability is defined as “a substantial functional limitation of daily life activities caused by physical, mental or sensory impairment and environmental barriers resulting in limited participation”.<sup>19</sup> This medical definition is slightly limiting as it requires medical proof of limitation in daily life activities. A more inclusive definition is the legal one promoted in the Convention on the Rights of Persons with Disabilities (CRPD), which focuses more on the rights of the individual rather than requiring the medical certification of the limitation.<sup>20</sup>

PLWD are more likely to be unemployed and are therefore more likely to live below the poverty line. In Uganda, 80 per cent of PLWD live below the poverty line with over 46 per cent being unemployed. A 2009 report by Foundation for Human Rights Initiative (FHRI) found that only 4 per cent of registered adult PLWD in Kasese District were employed. Most of them worked in the informal sector as entrepreneurs running individual income generating activities. It was also found that despite holding relevant qualifications, less than 10 per cent of PLWD in the district were engaged in active employment.<sup>21</sup>

19. Disability Act of Uganda.

20. Nyombi, C. & Kibandama, A. (2014). Access to employment for persons with disabilities in Uganda. *Labour Law Journal*.

21. *ibid*.



Access to employment by PLWD is hindered by the following barriers:<sup>22</sup>

- ④ Lack of implementation of PLWD-friendly policies – Uganda has several progressive national policies and laws that prohibit discrimination and protect the rights of PLWD in education and employment. These include the Constitution of 1995, Disability Act 2006, Employment Act 2006, National Council for Disabilities Act 2003, Equal Opportunities Commission Act 2008, Education Act, and Business, Technical, Vocational Education and Training (BTVET) Act 2008. However, the implementation of these laws and policies has been dismal. For example, although the Disability Act entitles employers who have at least 5 per cent of PLWD in their total labour force to a tax refund of 15 per cent, no company has claimed this refund.
- ④ Lack of knowledge and compliance with PLWD laws by employers – There is no formal tracking or database of employers with PLWD employees despite the fact that the Disability Act requires employers to submit annual reports showing their compliance to the PLWD quota requirement. Low levels of knowledge of PLWD laws and policies by employers, private sector, local and national government officials, and educational institutions is a major reason for the lack of implementation of the PLWD policies.
- ④ Lack of organisational disability inclusion plans and strategies – Most private sector and other institutions do not have the skills to conduct disability audits and develop disability inclusion plans and strategies. This is a lost opportunity in ensuring non-discrimination of PLWD in the workplace, especially in recruitment, training, promotion, retention and ensuring that the physical, mental, technological and social work environment of the company is suitable for PLWD needs. A report by the Uganda Equal Opportunities Commission found, for example, that many government institutions were not sufficiently PLWD friendly with respect to their physical access environment such as provision of ramps and PLWD washrooms.<sup>23</sup>
- ④ Unfavourable labour conditions faced by PLWD – PLWD who are in formal paid employment continue to face indirect discrimination such as: working without contracts, limited access to social benefits like sick leave or health insurance due to their concentration in casual, temporary or seasonal jobs; unfair dismissal to make way for able-bodied employees; lack of protection from occupational hazards; and insufficient technologies to support their equal participation in employment.
- ④ Lack of access to quality education that is relevant for the market – About 90 per cent of PLWD fail to access secondary school education, locking them out of many formal jobs. To address this problem, the government established Community Based Rehabilitation as a vocational training programme for PLWD. There are eight vocational rehabilitation centres in the country that offer PLWD skills in carpentry, nursing and tailoring. However, over 60 per cent of PLWD have not received any kind of rehabilitation training.<sup>24</sup> Those who were lucky to get the training and graduate were more likely not to get jobs and many do not have capital to set up their own businesses. The rehabilitation training has also been criticised for not meeting the labour market needs. There are also very few PLWD in mainstream educational institutions like the technical and vocational centres, universities and secondary schools.

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22. *ibid.*

23. *Equal Opportunities Commission Report (2017). Physical accessibility report.*

24. *Nyombi, C. & Kibandama, A. (2014). Access to employment for persons with disabilities in Uganda. Labour Law Journal.*





## 2.6 Participation of Women, Youth and PLWD in the Off-Grid Solar Value Chain

There is some global literature on women's participation on the energy sector generally and in the OGS value chain particularly. However, there are limited studies on youth participation in the OGS value chain and even much less information on PLWD participation. This study seeks to provide a local baseline assessment of the participation of these key groups in the value chain of the largely male-dominated OGS sector in Uganda.

Studies show that more women are participating in the value chains of traditionally male-dominated industries like energy. They are nonetheless represented more in sales and distribution and as micro-entrepreneurs, and less as technicians/maintenance, artisans/manufacturers, or owners of energy small and medium enterprises (SMEs). Women are therefore located more in the lower ranks of the OGS value chain that is less capital intensive and closer to the customer.

In Uganda, men form almost two-thirds of positions in the energy workforce, especially as owners or top management. Women are more located in middle management and sales positions. Organisations like Solar Sister and Energy 4 Impact have supported women micro-entrepreneurs but there are few programmes supporting women to become owners of medium to large OGS companies.<sup>25</sup> For instance, findings from interviews for this study found that there are only three women CEOs in over 200 solar companies in Uganda.<sup>26</sup>

The study established that the number of women and PLWD in the sector is low compared to the youth. The fact that OGS is a predominantly private sector where profitability comes before inclusivity is visible. However, if policy guidelines on GESI were to be respected and adhered to, the current scenario is likely to change positively.

The following table highlights the participation of entrepreneurs by sex in the renewable energy value chain in the Global Village Energy Partnership's (GVEP), now Energy 4 Impact (E4I) Developing Energy Enterprise Project (DEEP).

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25. EACREEE (2018). *Situation analysis of gender and sustainable energy in the East African Community*.

26. Interview with GESI study respondent.



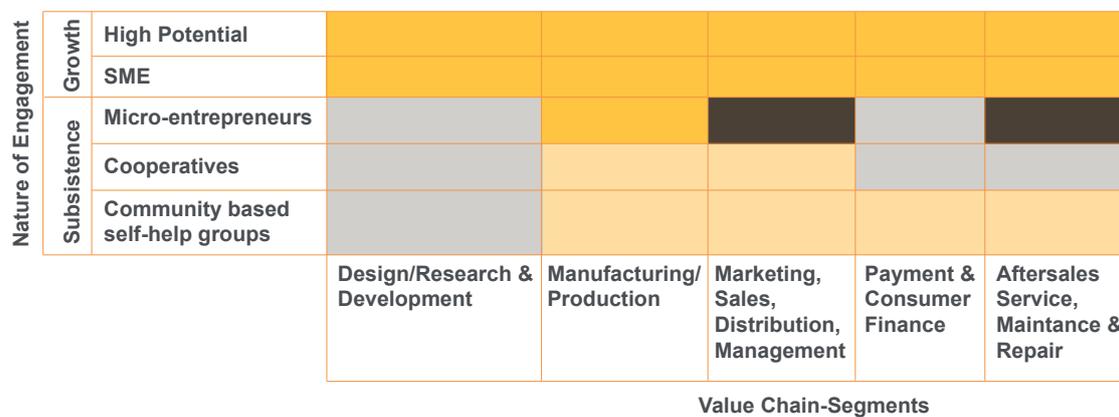
**Table 4: Percentage distribution of energy sector entrepreneurs by sex**

Technology	Female	Male	Mixed Groups
Cook stoves	196 (53%)	181 (36%)	10 (50%)
Solar	47 (13%)	183 (37%)	4(20%)
Battery Charging	3 (1%)	27 (5%)	0
Briquettes	104 (28%)	59 (12%)	6(30%)
Biogas	1(<1%)	28 (6%)	0
Others	18(5%)	18 (4%)	0
<b>Total</b>	<b>369 (100%)</b>	<b>496 (100%)</b>	<b>20(100%)</b>

Source: GVEP DEEP/EACREEE, 2018

Figure 4 illustrates the intersections between value chain segments and the nature of engagement by female entrepreneurs. Evidently, majority of women are engaged in micro-enterprises, community self-help groups and in cooperatives.<sup>27</sup>

**Figure 4: Integration of female entrepreneurs in off grid energy value chains**



**Key:** the shading represents the below classification of where there is a concentration of evidence of the business and social impacts associated with the involvement of women entrepreneurs in these various roles throughout the off-grid energy value chain, according to the literature reviewed

High concentration	Medium-low concentration
Medium-high concentration	Low Concentration

27. John Hopkins University, Babson College & ICRW (2019). Women's energy entrepreneurship: A guiding framework and systematic literature review.





Table 5: Percent distribution of women by position held in OGS firms within Eastern Africa

Country	% of firms with majority women ownership	% of firms with a woman as a top manager	% of permanent full-time women workers
Burundi	9	16	25
Kenya	9	13	29
Rwanda	13	20	32
South Sudan	7	10	23
Tanzania	10	14	44
Uganda	10	15	40

Source: World Bnk Enterprise Surveys, 2018

The benefits of women’s participation in the energy value chain are numerous, ranging from individual to family and societal. Some of the benefits include:<sup>28</sup>

- 
**Increased income** – Engagement of women in the value chain creates income-generating opportunities, which in turn improve their own and family livelihoods. Increased income also improves women’s self-confidence and agency as they have more control over resources.
- 
**Shifting household power dynamics** – Women in the value chain are more able to play a bigger role in household decision-making due to their contribution to household income. The household decision-making also includes where and how to use solar products in the home, how money is spent, as well as the welfare of the children and dependants.
- 
**Improved business and technical skills** – Women gain new skills working as technicians, repair and maintenance of solar products, or as micro-entrepreneurs.
- 
**Improved social networks** – Women typically have strong community and social networks, however, it has been found that women in the solar energy value chain, particularly those in sales and marketing and micro-entrepreneurs, are able to leverage and improve their social networks due to their new roles.
- 
**Shifting social norms** – Evidence has shown that women micro-entrepreneurs in the solar value chain have contributed to challenging social norms and stereotypes of women’s roles due to their active participation outside of the domestic sphere and as owners of businesses. Women solar technicians have also challenged the assumption that these roles are the preserve of men. The visibility of women in this male dominated value chain has enabled some women to enter leadership positions at community level such as in their savings and cooperative unions or in development committees.
- 
**Improved solar business outcomes** – Inclusion of women in the solar value chain has been found to increase sales of solar products. For example, a study of over 1,000 solar village level enterprises in Rwanda and Kenya found that women sold significantly more solar units than men, proving that there were increased sales due to inclusion of women sales agents.<sup>29</sup>

28. John Hopkins University, Babson College & ICRW (2019). Women’s energy entrepreneurship: A guiding framework and systematic literature review.

29. *ibid.*



## 2.7 Summary of Key findings

- The OGS sector is generating thousands of employment opportunities in emerging markets, ranging from entry-level to highly skilled positions. These opportunities have crucial impacts on individual livelihoods, rural and urban development, and on other sectors in the economy.
- In East Africa, employment across the value chain is estimated to rise from 75,000 in 2018 to 350,000 in 2030. East Africa is already a large market, with a relatively large proportion of PAYG sales.
- Half of Ugandan households (51 per cent) access at least one form of electricity, with 24 per cent having grid electricity (64 per cent in urban areas). Slightly more (27 per cent) rely on off-grid electricity (33 per cent in rural areas).
- With increased solar usage, the use of canister-wick lamps (kerosene) has declined from 58 per cent to 28 per cent between 2013 and 2017. Further, Uganda intends to reduce the share of biomass energy in cooking from 85 per cent to 50 per cent and, correspondingly, increase the proportion using clean energy for cooking from 15 per cent to 50 per cent.
- In Uganda, solar contributes to lighting 22 per cent of the households compared to 18 per cent from grid electricity in rural areas.
- Women tend to work in jobs that have less risk, are in the informal sector due to flexible work hours that consider their multiple social roles and time poverty, and have fewer barriers to entry.
- PLWD are more likely to be unemployed and are therefore more likely to live below the poverty line. In Uganda, 80 per cent of PLWD live below the poverty line with over 46 per cent being unemployed.
- Access to employment by PLWD is hindered by several barriers, including lack of implementation of PLWD-friendly policies, lack of knowledge and compliance with PLWD laws by employers and lack of organisational disability inclusion plans and strategies, among others
- The benefits of women's participation in the energy value chain are numerous, ranging from individual to family and societal.



### 3 OPPORTUNITIES, BARRIERS AND RECOMMENDATIONS FOR PARTICIPATION OF WOMEN, YOUTH AND PLWD IN THE OGS VALUE CHAIN

This section presents study findings drawn mainly from primary sources. The qualitative data was analysed based on the key research questions for the study. Factors contributing to participation of various target groups across the OGS value chain, opportunities and existing barriers form the narrative in this section. Some case studies and best practices have also been presented to strengthen the emerging results.

#### 3.1 Factors that Contribute to Women's Participation in the OGS Value Chain

Studies have shown there are four main factors<sup>30</sup> that support women's participation in the energy value chain:

- ☉ **Training** at personal level to promote self-confidence and agency, and at technical and business level to promote entrepreneurship and technical skills in OGS. Training that empowers women to be more competitive and risk takers will also enable women solar entrepreneurs to reach their potential.<sup>31</sup>
- ☉ **Access to finance and capital** to fund their education, training as well as business start-up and expansion.
- ☉ **Access to mentors, coaches and networks** to improve their business skills, role models and family support to encourage women to enter and thrive in the male-dominated energy sector.
- ☉ **Gender quotas and gender policies** encourage women's participation in different levels of the value chain. Quotas should be accompanied by deliberate promotion of girl-child education in STEM, vocational institutions, as well as business, mentorship and other training.

#### 3.2 Opportunities for Women, Youth, PLWD Participation in the OGS Value Chain

The private sector stakeholders who participated in this study included companies and other institutions operating in the OGS value chain. The study sought to establish whether these entities have policies that encourage participation of women/youth/PLWD in OGS PUE and in the OGS value chain.

The study found that some entities have policies targeting inclusion of women in the value chain, however, none of these have policies targeting PLWD. Some entities have a gender policy, which states that half of the employees should be women, but majority have not achieved the 1:1 male to female ratio (gender parity). Other inclusive policies specifically target women as end-users of SAS products and services. Entities that have gender inclusive policies are more likely to succeed in obtaining grants for development.

A respondent stated: *"Within the policy, we state that our services should reach women. From that policy, we were able to apply for the UNCDF grant. We got a grant from UNCDF in 2018/19 to empower women in refugee camps in Bweyale and Nakibaale. The grant was to support women's businesses using off-grid solar"*.

30. John Hopkins University, Babson College & ICRW (2019). *Women's energy entrepreneurship: A guiding framework and systematic literature review.*

31. University of Cape Town & IPA (2019). *Female microenterprise creation and business models for private sector distribution of low-cost off-grid LED lighting: Multiple randomised experiments.*



Gender inclusive policies have a higher promise in enhancing gender parity in employment of women, youth and PLWD. A company representative noted: *“For youth, we try to employ them as a way of promoting youth employment. For example, one company has partnered with an organisation called Challenges Uganda to provide internships for the youth”*.

Most OGS entities have registered a 1:1 male-female ratio in the sales force. This means women are as likely to be employed in sales and marketing departments of OGS companies as men.

The study also established that gender parity goals in the OGS value chain are more likely to be met in urban areas compared to rural areas. In rural areas, there are more men conducting sales of OGS products than women. This rural-urban could be influenced by gender stereotypes that are still higher in rural areas compared to urban areas. Women are likely to feel more comfortable marketing and selling SAS products in urban areas where social and cultural norms about gender roles have improved. Overall, there is a good environment for gender inclusive company policies. A company representative outlined key GESI issues that are presented in the following box

- Our network integrates gender issues in its activities.
- We have a thematic working group on gender, technology and innovation.
- We have a slot for youth on the Network Steering Committee.
- Even when we invite participants, we include youth and women.
- We have outlined gender inclusion in our memorandum of principles and strategic plan.
- We have not had a specific slot for PLWD, but it is something that we will take on board in future.
- In our sales network, we have many female agents. In the office, we have more women than men.
- Our policies are guided by national policies on achieving gender equality by 2030.

The study also found that some of the entities do not have affirmative action embedded in their recruitment policies, thus leaving out potential female employees in favour of men. A representative of one entity noted that they encourage participation from women in sales and purchase of SAS products. As end users, SAS products are benefitting more women than men at household level through solar home systems (SHS) for lighting homes, where women spend more time on domestic chores.





### 3.3 From Policy to Practice: Gendered Patterns in Employment Along the OGS Value Chain

This study reveals that more women are entering the OGS sector and are climbing the employment ladder through well-earned promotions. A company representative noted:

*“In our company, we try to enforce participation of women and PLWD although it has not been very successful. In Kampala, we have four in-house staff, out of whom one is female. In the field operations, we partnered with iWay (an Internet service provider) to provide Internet. At the sites, we have insisted that these agents must be women. Although we do not have PLWD, we try to be an equal opportunities employer, especially as far as gender equality is concerned due to EU (European Union) and UK (United Kingdom) regulations. In Northern Uganda, which is going to have the biggest solar mini-grid, we have explicitly set out that women should be recruited”.*

There are also instances where companies are interested in hiring women but only men end up putting in an application. This may not necessarily imply women are not qualified, but men tend to be more aggressive in applying for jobs irrespective of whether the workstation is at the central office or in the field. A respondent noted that women are also less likely to apply for a job in a new company since they tend to examine several factors before applying for a job, such as job security and proximity to family, particularly so for mothers and married women.

The study found most OGS companies have no PLWD employees, while the few who have them employ PLWD as support staff with none employed as technicians or in management.

### 3.4 Missed Opportunities and Stereotyping of Women in the Artisanal and Operational OGS Value Chain

Overall, the study found that most OGS solar technicians are male, especially in rural areas. For most companies, it is easier to get men as technicians because they are more likely to have electrical training and attained a higher level of education in STEM.

The study reveals a number of stereotypes that limit women’s full participation in the artisanal and operational OGS value chain. The National Plumbers Association of Uganda (PAU), for example, does not have a woman member, nor has it trained women as plumbers. This has left women out of OGS sales and marketing since some companies use plumbers to market solar water heaters to clients.

A male manager of a private solar company noted:

*“Installation of solar water heaters is tricky because it is done on the roof or ceiling. We have not seen any women plumbers yet. We have not trained any women. We train men to undertake installations, we assume that the money a man makes goes back to their families. Unlike masonry where women are beginning to be involved, plumbing takes a lot of hard work, which is not suitable for women. In the solar sector, therefore, there are few women technicians. For example, we have had one female technician in the two years I have worked here”.*

Such gendered notions have been disputed. For example, studies have shown that women are not automatic beneficiaries of money earned by men. In addition, women have demonstrated that they can work in technical areas such as electrical wiring, road construction, machine operation and building and construction, among others.



There are still very few women applying and graduating in electrical and technical courses at vocational institutions and universities. Although some vocational institutions have affirmative action policies to attract women, they still get few or none applying.<sup>32</sup> Low numbers of girls and young women in STEM at all levels of education ultimately contributes to the low numbers of women as technicians in the OGS value chain.

Some institutions are making deliberate efforts to break these gendered stereotypes. For example, the Lutheran World Federation (LWF) has been training women as technicians in solar energy. Winch Energy, an OGS company, is partnering with LWF to hire and train female OGS technicians.

### 3.5 Women in Managerial Positions in the OGS Value Chain

The box below contains examples of statements from the study respondents that provide evidence that there are women in managerial positions at OGS institutions, albeit in small numbers compared to men

- ☼ The head of REA (Rural Electrification Agency) is a woman.
- ☼ ERA (Electrical Regulatory Authority) is headed by a lady and the head of the legal department is also a lady.
- ☼ Ministry of Energy also has many female staff.
- ☼ Solar irrigation unit (our core business) is headed by a lady.
- ☼ Our logistics manager is a lady.
- ☼ The human resource manager is a lady.
- ☼ The finance manager is a lady.
- ☼ There are five positions at managerial level with three men and two women.
- ☼ Three female CEOs out of 200 solar companies.
- ☼ For PLWD, there is no representation as far as I know.

The study also found that the Uganda Solar Energy Association (USEA) has four staff, two of whom are female – the CEO and communication manager are male, while the administrator/coordinator and membership officer are female.

Another company has 10 technicians, three of whom are women. The company's representative noted: "When we go into the field and the community sees female technicians, this attracts more customers because they are amazed that the females are in a male field. They admire what they are doing".

A good example of an organisation with explicit gender policies is the Renewable Energy Civil Society Organisations (RESCOs) Network. RESCOs has three males and two females in the Secretariat. Women are well represented in RESCOs governing bodies, such as the Steering Committee. It has three sub-regional hubs and networks, each with coordinators who are all women. Youth represent 25 per cent of their members. At another company, women make up two-thirds of supervisors and managers.

It is also evident that women are more in administrative, sales, agent and customer care positions. There are few female technicians and solar business owners, with majority of OGS companies led by men (three female CEOs out of 200 companies).

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*32. Interview with study respondent.*



### 3.6 Challenges and Barriers for Women, Youth and PLWD Participation in Artisanal, Operational and Managerial Levels of the OGS Value Chain

The study established that a number of development partners and GoU are working towards increasing the number of female owners of SAS products and OGS businesses. Most interviewees felt that support from government towards increasing the number of women, youth and PLWD in future tenders in mini-grids and on-grid energy projects is critical.

The study observed that there are more opportunities for women than men in the entire value chain. However, there needs to be more capacity building for women, youth and PLWD on renewable energy and OGS in order for these groups to benefit equally in access to and control over the OGS value chain. In addition, more public awareness needs to be created, especially in rural areas, on benefits and affordability of OGS. A company representative observed: *“Most people do not know that solar is available as an alternative to grid power. There is an on-going narrative that solar is expensive and yet compared to grid electricity, solar is affordable. We can provide structured finance and payments such as pay back over a number of months”.*

Several challenges are notable in the role currently played by women in artisanal, operational and managerial levels in the OGS value chain. The challenges can be divided into two dimensions: individual-community challenges and systems challenges.

#### Individual-community challenges

Overall findings indicate a high level of mistrust among the public regarding SAS products. The main challenge is poor quality of products. Most solar companies import components, which impacts on the price, quality and qualifications of technicians who install the products.

Negative attitudes towards women engaging in a “man’s role” are pervasive in the communities. Most people perceive the involvement of women in the OGS value chain, especially as technicians, as counter to socio-cultural norms. At the individual level, women are perceived as lacking information, training and skills to effectively engage in the OGS value chain.

It is also perceived that PLWD are not interested or cannot work in the solar sector. The few who are employed in this sector are in lower cadre support roles, mainly office jobs, with no motivation to gravitate towards artisanal and operations levels.

The findings also indicate that reproductive and family related issues (e.g. pregnancy) hinder women’s participation in the OGS value chain, especially as technicians since this position is perceived as being too physically demanding for them.

#### Systems challenges

The perception of the solar industry as a male domain needs to be deconstructed. Some pacesetters such as Winch Energy are using women as technicians and in energy communication and awareness raising.

Many companies interviewed seem to believe the gendered socio-cultural norms and stereotypes that lock out women and PLWD from manual and physically taxing positions like technicians. Installation of solar panels and batteries is still perceived as “hard” for women and PLWD.



Companies are not investing in equipment to aid women and PLWD to do their job on an equal footing with men and able-bodied persons, respectively. This fact is supported by lack of women friendly areas of operations. In addition to lack of qualified women technicians, there are fewer females in the top management of OGS companies. Most females are found in middle management and sales.

It is evident that there is an urgent need to build capacities of OGS companies to integrate GESI in the value chain to ensure inclusion of women, youth and PLWD in the OGS value chain. The study notes that most OGS companies are afraid of hiring PLWD thinking that they will be unable to deliver on targets, coupled with a general lack of awareness and knowledge on PLWD laws and policies.

### 3.7 Examples of Best Practices Enabling Women's Participation in the OGS Value Chain in Africa

The following case studies are excerpts from the African Development Bank's study on the renewable energy sector in Africa.<sup>33</sup>

#### **Barefoot College (an initiative of SE4ALL, UN Women and Clinton Global Initiative)**

For over 40 years, the Barefoot College has used innovative means to bypass barriers restricting women's active participation in the energy sector. This is done through technical training and capacity building to enable women to become solar engineers and scale technology in their communities. The women are thus able to train even more women in their communities and beyond.

Financial, leadership and governance training enable them to plan and lead effectively. The women are equipped to bring electricity to their communities (most for the first time). They also introduce a renewable and sustainable source of energy that can be maintained and replicated in other communities. Villagers pay towards the costs of equipment and maintenance in five-year instalments, with the funds also ensuring that the women engineers receive a monthly stipend for their work.

A 20-watt solar panel, one 12-volt battery, one cell phone charger and three 9-watt lamps are supplied to every participating household. Barefoot College now has more than 70 trained, rural, semi-literate and illiterate women working as solar engineers in Sierra Leone and Liberia. An initiative with UN Women also provides distribution, installation and maintenance of household solar electrification and mini solar plants for diagnostic clinics and maternal health centres.

The Barefoot College has also committed to launching six regional training centres in Africa to train 560 illiterate rural women on how to electrify their villages with solar energy within six months of training. Initiatives currently exist in Burkina Faso, Liberia, Senegal, South Sudan, Zanzibar and Tanzania. Benefits of the programme include savings on the cost of kerosene and charging cell phones at the local market. Another benefit is a decrease in health and safety hazards due to lower use of highly flammable kerosene. (See [www.barefootcollege.org](http://www.barefootcollege.org))

#### **Solar Sister supports women micro-entrepreneurs in Africa**

Solar Sister uses an innovative approach to promote off-grid lighting: a micro-consignment model applied by partnering with formal and informal women's organisations. Solar Sister extends provides women with the device inventory to sell to others, including mobile technology. Participating women offer to charge others' phones for a fee using their off-grid energy device, supplementing their income. Efficiency is ensured in the programme through the use of mobile banking and text messaging to communicate with the entrepreneurs and streamline funds. (See [www.solarsister.org](http://www.solarsister.org))

33. African Development Bank (2016). *Empowering women in Africa through access to sustainable energy: A desk review of gender focused approaches in the renewable energy sector.*



### 3.9 Summary of Key Findings

- GESI responsive policies, access to capital and training are key to women's meaningful participation in the OGS value chain.
- While there are OGS entities that have policies targeting inclusion of women in the value chain, none have policies targeting PLWD.
- Most OGS entities have registered a 1:1 male-female ratio in their sales force, which means women are as likely to be employed in sales and marketing departments of OGS Companies as men.
- Women are likely to feel more comfortable marketing and selling OGS products in urban areas where social and cultural norms and values have significantly changed.
- In the rural areas, there are more men in sales than women. This disparity could be caused by gender stereotypes that are still higher in rural areas compared to urban areas.
- Most OGS technicians are male, mainly based in rural areas. For most companies, it is easier to get men as technicians because they are more likely to have electrical training and attained a higher level of education in STEM.
- Most OGS companies have no PLWD employees, only a few are employed as support staff. The study did not find any PLWD in artisanal or managerial positions.
- There are very few women in managerial positions. For example, there are only three female CEOs out of 200 solar companies in Uganda.
- Most interviewees felt that GoU should implement existing gender mainstreaming policies to ensure an increase in the number of women, youth and PLWD in future tenders on mini-grids and on-grid energy projects, for example as owners of OGS companies or local content workers.
- Most people perceive the involvement of women in the OGS value chain, especially as technicians, as counter to the socio-cultural norms. At the individual level, women are perceived as lacking information, training and skills to effectively engage in the OGS value chain.
- The perception of the solar industry as a male domain needs to be deconstructed. Some companies, such as Winch Energy, are setting the pace in changing this by using women as technicians and in energy communication and awareness raising activities.

## 4 RECOMMENDATIONS

Since the energy policy environment in Uganda is conducive, it is imperative that the recommended short-term-quick wins as well as longer term initiatives are adopted by stakeholders. The recommendations are made in view of the prevailing gaps in GESI mainstreaming in the OGS value chain.

- **Conduct GESI trainings for OGS companies**
- **Train female users to become sales agents**
- **Strengthen women's mentorship along OGS value chain**
- **Initiate gender sensitive approaches to encourage girls into vocational institutes**
- **Government should take lead in promoting GESI in the OGS value chain**
- **Need for specific funds to promote GESI in the OGS sector**
- **Develop incentives to encourage OGS companies to promote GESI**
- **Develop case studies on what works in GESI in OGS**
- **Capacity building of women's organisations in energy for GESI accountability of OGS sector**
- **Build database of Women, Youth, PWDs in OGS value chain**
- **Initiate gender scorecards in OGS companies**

## 4 ANNEXES

### Annex 1: Data Tables on International Perspectives on GESI and OGS Labour Market

Table A1.1: Employment status for the working age population (14-64 years), 2012/13 and 2016/17

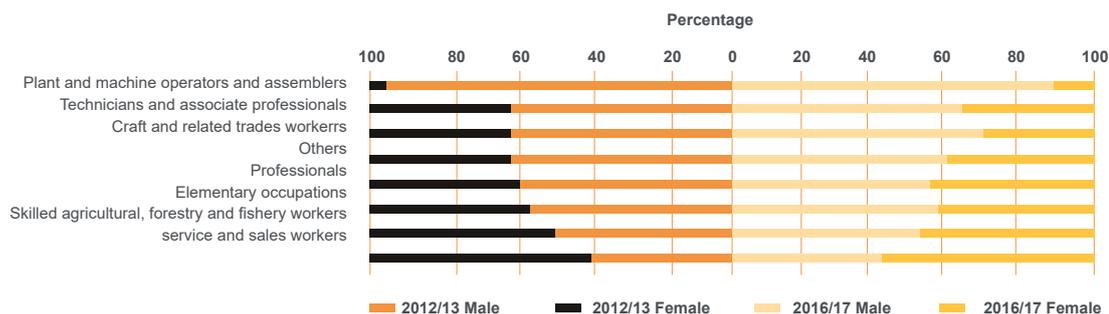
Percentage distribution (%) and see sex distribution (%)

Employment Status	Percentage				Sex distribution %			
	2012/13		2016/17		2012/13		2016/17	
	men	Women	men	Women	men	Women	men	Women
Paid employee	51.1	35.0	46.2	28.6	62.4	37.6	67.7	32.9
Employer	2.4	1.1	5.5	2.9	71.3	28.7	70.7	29.3
Own account worker	37.7	48.7	44.0	58.2	46.9	53.1	48.8	51.2
Contributing family workers	8.9	15.3	4.3	10.4	39.7	60.3	34.1	65.9
<b>Total, %</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>				

(Source: UBOS, UN WOMEN, CSBAG, EPRC, 2019)

Table A1.2: Main job of the working population (14–64 years), 2012/13 and 2016/17

Sex Distribution (%)



(Source: UBOS, UN WOMEN, CSBAG, EPRC, 2019)

Table A1.3: Key youth labour market indicators – Traditional distribution by sex, 2013 and 2015 (%)

	Total		Male		Female	
	2013	2015	2013	2015	2013	2015
Employed	63.1	64.5	65.2	69.1	61.1	60.8
Unemployed	3.3	4.5	2.9	4.0	3.7	4.9
Inactive	33.6	29.8	31.9	25.7	35.2	33.2
Total youth population	100	100	100	100	100	100
Youth labour force participation rate	66.4	69.0	68.1	73.1	64.8	65.6
Youth unemployment rate ( strict definition )	5.0	6.5	4.2	4.2	5.7	7.4

(Source: SWTS, 2017)

Table A1.4: Youth neither in employment, nor in education or training by composition and sex, 2013 and 2015 (%)

Sex	2013			2015		
	of which			of which		
	NEET rate	Unemployed non-students	In-active non-students	NEET rate	Unemployed non-students	In-active non-students
Total	12.2	2.7	9.5	13.2	3.5	9.7
Male	7.1	2.3	4.7	6.6	2.5	4.1
Female	16.9	3.0	13.8	18.6	4.3	14.3

Table A1.5: Employed youth by status in employment and sex, 2013 and 2015 %

Status in employment	Total		Male		Female	
	2013	2015	2013	2015	2013	2015
	Wage and salaried workers (employees)	24.6	24.9	32.9	32.4	16.6
Employers	2.6	3.9	3.5	5.1	1.7	2.8
Own-account workers	50.5	43.1	43.7	36.3	57.1	49.5
Contributing (unpaid) family workers	21.4	27.7	19.1	26.0	23.6	29.4
Members of Producers' cooperative	0.2	0.1	0.2	0.1	0.3	0.1
Not classifiable by status	0.6	0.3	0.6	0.1	0.7	0.4
Total employed youth	100	100	100	100	100	100

(Source: SWTS, 2017)

Table A1.6: Distribution of youth employment by sector, aggregate, 1-digit level and sex, 2013 and 2015 (%)

Sector	Total	Male		Female		
	2013	2015	2013	2015	2013	2015
	<b>Agriculture</b>	<b>60.0</b>	<b>57.2</b>	<b>56.5</b>	<b>53.3</b>	<b>63.4</b>
<b>Industry</b>	<b>8.5</b>	<b>10.9</b>	<b>12.8</b>	<b>15.8</b>	<b>4.4</b>	<b>6.2</b>
<b>Services</b>	<b>31.4</b>	<b>32.1</b>	<b>30.5</b>	<b>30.7</b>	<b>32.2</b>	<b>33.0</b>
Agriculture, forestry and fishing	60.0	57.2	56.5	53.3	63.4	60.9
Mining	0.5	1.1	0.8	1.0	0.2	1.2
Manufacturing	5.4	5.6	6.9	6.8	4.0	4.5
Electricity, gas, steam	0	0.3	0.1	0.3	0	0.2
Water supply	0.1	0.1	0	0.2	0.1	0
Construction	2.5	3.8	5.0	7.5	0.1	0.3
Wholesale and retail trade	16.6	14.4	13.8	12.7	19.3	16.0
Transport	3.1	4.7	6.1	9.2	0.1	0.4
Accommodation	1.7	1.5	0.8	0.9	2.6	2.0
Information and communications	0.5	0.3	0.4	0.3	0.7	0.2
Financial activities	0.6	0.2	0.3	0.1	0.2	0.3
Real estate	0	0.1	0	0.2	0	0
Professional scientific activities	0	0.3	0.1	0.5	0	0.2
Administrative and support activities	0.6	0.2	0.8	0.2	0.3	0.2
Public administration	0.3	0.2	0.4	0.2	0.3	0.1
Education	3.4	3.4	2.7	2.4	4.0	4.3
Health and Social work	0.6	1.0	0.6	0.9	0.6	1.0
Arts and entertainment	0.3	0.3	0.5	0.4	0.1	0.2
Other services	2.4	2.9	2.6	2.0	2.1	3.8
Private households	1.3	2.6	1.0	0.7	1.5	4.3
Activities of extraterritorial organizations	0.4	0	0.4	0	0.4	0

## Annex 2 List of Study Participants

No.	Name	Position	Organisation
1	Lameck Kiirya	General Manager	Igara Growers Tea Factory
2	Jackson Byaruhanga	Deputy General Manager	Igara and Buhweju Tea Factory
3	Waringa Matindi	Chief Executive Officer	Village Energy
4	Julius Magala	Digital and Energy Finance – Coordinator	United Nations Capital Development Fund (UNCDF)
5	Alex Wanume	Country Manager	Winch Energy
6	Seye Ogunrotini	General Manager – Technology and Innovation	Balton Uganda
7	Benon Bena	Manager, Off-Grid Renewable Energy Development	Rural Electrification Agency (REA)
8	Eileen Lara	Energy Officer	Centre for Research in Energy and Energy Conservation (CREEC)
9	Moses Okwonga	Executive Director	Africa Youth Forum Against Poverty
10	David Muwonge	Deputy Executive Director (Finance, Administration and Compliance)	National Union of Coffee Agribusiness and Farm Enterprises Limited (NUCAFE)
11	Pia Hopfenwieser	Head of Component, Electricity	Energising Development (ENDEV) Uganda, GIZ
12	Bettina Ssemwaka Baesch		GIZ
13	Helen Kyomugisha		GIZ
14	Anja Rohde		GIZ
15	Fred Muwanga	Principal	Nakawa Vocational Training Institute
16	Eunice Among	Programme Manager	National Union of Women with Disabilities in Uganda (NUWODU)
17	Peninah Kyarimpa	Project Manager, Social and Environmental Responsibility (SER)	aBi Development Limited
18	Charles Barazah	Country Manager	Azuri Technologies
19	Doreen Nambooze	Membership Officer	Uganda Solar Energy Association (USEA)
20	Esther Kagezi	Human Resource Manager	Power Trust Uganda Limited
21	Florence Kuteesa	Executive Director	Council for Economic Empowerment of Women in Africa (CEEWA)
22	Mr Odia	Senior Technician	Solar Energy for Africa
23	Arafa Kamoga	Coordinator	National Renewable Energy Civil Society Organisations Network (RESCO)



ACE TAFP PARTNERS INCLUDE:



STRATEGIC PARTNER:



## Tet Tetra Tech International Development

Fourth Floor, Prosperity House, Westlands Road |  
PO Box 19084 – 00100 | Nairobi, Kenya.