



## **FINAL REPORT - Summary**

### **Beyond the Grid Fund for Africa (BGFA)**

#### **Job creation and skills development programme in Uganda**

**By Renewables Academy (RENAC) AG**

In partnership with:

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Uganda Solar Energy Association (Sub-contractors)

Association of Sendea Members Uganda (Sub-contractors)

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## Acronyms and Abbreviations

BGFA	Beyond the Grid Fund for Africa
SHS	Solar home systems
ESP	Energy Service Provider (also, BGFA investees)
SDG	Sustainable Development Goals
NEFCO	Nordic Environment Finance Corporation
RENAC	Renewables Academy AG
Inensus	Inensus GmbH
USEA	Uganda Solar Energy Association
Sendea	Association Sendea Uganda UG
ToR	Terms of Reference
CAN	Capacity Needs Assessment
O&M	Operation and Maintenance
TtT	Train-the-Trainers programme
PAYGo	Pay-as-you-go systems
MPM	MicroPower Management (software)
Nakawa VCT	Nakawa Vocational Training College
BMC	Business Model Canvas

## Executive Summary

The Beyond the Grid Fund for Africa (BGFA) Uganda skills development programme sought the development of the off-grid energy sector by equipping participants with vital **technical, interpersonal and business skills on Solar home systems (SHS) and solar mini-grids**. The programme included a strong focus on inclusivity, hands-on learning, and market-relevant training to laid the **foundation for sustainable growth and employment generation** in Uganda’s solar off-grid energy sector.

The results and activities described in this report (including Annexes) elaborate how this programme has **achieved these objectives** and further participation targets, both quantitative and qualitative. The report also includes **recommendations for further actions** to sustainably maintain the successes achieved through this programme, ensuring alignment with the project’s overarching objectives.

The capacity-building initiative delivered significant outcomes, addressing key technical, business and soft skill gaps in Uganda's solar off-grid sector. Over **20 training sessions** on a comprehensive range of themes were conducted, focusing on the two main components of solar home systems (SHS) and mini-grids. A total of **313 participants** were trained, exceeding participation targets and achieving a strong representation of **32% women**.

The training programme had a **flexible and tailored approach to cater to the diverse needs and availability of participating companies and individuals, ensuring** broad and effective engagement. This also allowed participants to acquire targeted knowledge and skills directly applicable to their roles, significantly enhancing the training’s overall effectiveness. Addressing regional variations and specific organizational challenges further increased the applicability and impact of the training.

**Hands-on learning** emerged as a crucial element, with practical sessions such as troubleshooting, repairing and quality aspects of Solar home systems and using monitoring software for mini-grids enhancing skill retention and applicability. These experiences provided participants with real-world insights, enabling them to better understand the technical complexities and operational challenges of the off-grid energy sector. By bridging the gap between theory and practice, hands-on learning ensured that participants could confidently apply their skills in their professional environments.

**Inclusivity** also played a vital role, as bringing together diverse participants, including Energy Service Provider (ESP) staff, free agents, and external stakeholders, fostered knowledge exchange and broader sector impact. This diversity encouraged the sharing of varied perspectives and experiences, enriching the learning environment and building stronger networks within the sector. Such collaborations promote a more integrated and supportive community, crucial for the sustained growth of the off-grid energy sector.



Female participant in a practical SHS training session

**Gender inclusion** was also a key cornerstone of the programme, with proactive measures to integrate a gender perspective into the training design.

This approach encouraged women to take on leadership roles in the solar market and actively involved them as trainers and content developers, surpassing gender inclusion targets. These efforts are critical for fostering a more inclusive and equitable renewable energy landscape in Uganda.

In the second phase of the project, more **innovative trainings were implemented after the previous feedback phase**, including subjects of special relevance for the participants and the BGFA programme itself, such as E-waste management, work ethics, business opportunities with mini-grids and a train-the-

trainers programme only for women, altogether aiming at the sustainable achievement of the whole skilling programme outcome.

Last but not least, to further professionalize the solar sector, all participants who met the course requirements received **accredited certificates of completion**. This recognition not only enhances employability but also reinforces the programme's contribution to building a skilled workforce capable of driving the growth and sustainability of Uganda's off-grid solar market.

In conclusion, the BGFA Uganda skills development programme has demonstrated not only its success in achieving their objectives but also its capacity to drive significant advancements in the off-grid energy sector.

Still, **continued efforts to scale** these learnings and address identified challenges will be pivotal in achieving Uganda's off-grid electrification goals. Recommendations and next steps have been included in this report, following the spirit of sustainability and commitment to the improvement of the off-grid solar sector of the consulting team and all the actors involved in this project.

## 1 Context of the training programme

### 1.1 Background of the project

According to the 2021 Tracking SDG 7 report<sup>1</sup>, the rural electrification rate in Uganda was only 32% in 2019 (latest data available). SDG 7 targets 100% energy access by 2030. In many cases, mini-grids and standalone systems (Solar home systems or SHS, portable systems) are the most cost-efficient solution to provide electricity access in off-grid areas.

Enhancing employment and skills in the off-grid sector in Uganda is a key priority of the **Beyond the Grid Fund for Africa (BGFA)**'s Uganda country programme. Further to an initial request by Denmark, a scoping study was undertaken by Oxford Policy Management together with CREEC and BOPInc to assess the opportunities for enhancing job creation in Uganda within the context of the BGFA programme for off-grid electricity and clean cooking solutions. The scoping report investigated ways to support the job creation and skills development needs in the Ugandan off-grid sector and how BGFA could best contribute to that agenda. The report concluded with recommendations for the design of an enhanced skills development sub-programme for the BGFA Uganda country programme.

The report confirmed the need for **skills development on several aspects of off-grid energy actors**. There is a continuing and pressing requirement to increase technical skills across off-grid solar (including lanterns, SHS, and mini-grids). There are two main drivers for this. First, the level of technical expertise currently is too low across the sector. Although exact data is not available, it is known that there are significant numbers of technicians operating without the correct training or certification. In addition, companies struggle to recruit skilled workers, and there is dissatisfaction with training options. Second, Uganda's ambitious off-grid expansion plans will require a significant increase in skilled technicians.

The off-grid sector is also lacking a range of business skills, including skills in project management, entrepreneurship, financial management, and sales which are believed to be holding back the industry. In particular, gaps exist within smaller companies, which restrict growth and the ability to access finance for example due to the inability to record financial performance or produce convincing business plans.

According to these conclusions, BGFA's next level goal in Uganda is to **scale up businesses through specialised training in these areas of greatest potential in order to accelerate access to off-grid energy** for customers in peri-urban and rural areas. BGFA aims to support a significant number of Energy Service Providers ("ESPs") and their off-grid energy market development activities through capacity building. The capacity building will target both staff selected ESPs and also participants who are not ESP staff (free agents and staff of other entities in the energy access sphere).

**Nefco**, as BGFA's promoter of this programme contracted the Consortium or Project Team consisting **Renewables Academy (RENAC) AG, Inensus GmbH, USEA and Sendea UG**, ("Consultant" or "Consortium") to undertake the design, organisation and provision of these training courses in Uganda in order to develop participants' technical, sales and business skills within the area of solar home systems and mini-grids according to these goals.

### 1.2 Description of the service

The first component relates to standalone solar home systems, and includes both technical (e.g., installation and maintenance) as well as sales and business skills training. The second component is focused on technical training skills and related markets perspectives to the developing mini-grid sector in Uganda.

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<sup>1</sup> <https://trackingsdg7.esmap.org>



## 2 Inception of the training programme

### 2.1 Main findings of the capacity needs assessment

As the key first step for the design of the training programme, a comprehensive Capacity Needs Assessment (CNA) was conducted. Its aim was to map ESP members' and other relevant stakeholders' personnel's competencies and skills needs to scale up their businesses in the solar off-grid sector in Uganda.



Figure 1: images of the inception phase

#### Key findings of the assessment

These were the main areas of training improvement and job creation opportunities identified:

- Advanced technical skills on installation, commissioning, and testing
- Sales and after-sales
- Product quality assurance and operation and maintenance (O&M)
- Operation and Project management
- Other business models and applications
- Interpersonal and related skills
- Gender perspective

As for the CNA main results, the most in-demand job profiles require training in technical and quality aspects of both solutions, as well as in transversal and interpersonal competences. In addition, although most ESPs work mainly with SHS, there is a shared interest in learning more about mini grids as a possible new business area (as a sector with great growth potential in Uganda).

Gender inclusion also faces some challenges. Designed to support ESPs and other relevant stakeholders, the programme targets 300 participants, with 30% being women, to drive business growth and foster inclusivity. However, the rate of women's inclusion in the Ugandan energy sector is low, and the majority of women's positions in these ESPs are limited to after-sales service areas and upper-intermediate management positions.

#### Core Training Areas:

- Focus on technical skills for advanced installation, maintenance, testing, and quality assurance of SHS and mini-grids.
- Develop business skills such as project management, financial planning, and risk management to enable ESPs to adopt new business models and explore growth opportunities.
- Enhance sales and interpersonal skills, including customer engagement, after-sales support, and leadership for improved team performance.
- Highlights the need for specialized knowledge in mini-grid operations and business models to meet growing customer demands.

#### **Blended Learning Model:**

- The need to combine face-to-face and online sessions to ensure flexibility and accessibility.
- Modular, shorter-duration courses reduce logistical challenges, encouraging participation from women and rural participants.

#### **Addressing Barriers:**

- Partial allowances for travel and meals improve accessibility for rural participants and those unaffiliated with ESPs.
- Professional certifications like the one issued by RENAC AG provide industry-recognized credentials, enhancing career prospects and incentivizing participation.

#### **Gender Inclusion:**

- Addresses logistical, cultural, and social constraints limiting women's participation in technical and leadership roles.
- Develop specific training programmes for women to promote their employability in senior and managerial positions
- Flexible schedules and targeted training sessions promote women's involvement, encouraging ESPs to support their professional development.

#### **Ensuring Long-Term Impact:**

- Follow-up activities like Train-the-Trainer (TtT) sessions to create a self-sustaining training ecosystem.
- Certifications that help to professionalize the sector, boosting trust and workforce credibility.

#### **Project Team Contributions:**

- The project team's expertise in communication campaigns and participant selection ensured effective outreach and a top-down approach to identifying and engaging participants.
- Local partners and trainers contribute effectively to the project's success

### **3 Implementation of the training programme**

#### **3.1 Development of capacity building programme and trainings**

Two modular training programmes and materials, tailored for each component or solution, were developed to ensure flexibility in delivery through a combination of face-to-face and online sessions. A modular approach was applied, this allowing adaptable scheduling to accommodate diverse participant needs, particularly women and those participants coming from outside Kampala. Also, in order to facilitate content update, when appropriate.

As regard the follow-up activities, more specified training' and Train-the-Trainers' sessions were planned, looking to ensure long-term impact by creating a self-sustaining training ecosystem. The repetition of some of the first training was also considered.

All the actors involved prepared practically-oriented exercises by using actual examples, case studies and exercises. These materials were ultimately shared with the certified participants after successful completion of each of the trainings.



### 3.1.1 Feedback and quality assurance mechanisms

As part of the sustainability and demand driven approach of the training programme, the collection of insights and feedback was fundamental. Getting the programme’s participants opinion to provide their assessment at the end of each training was key. Specially as food for thought for the selection and final design of the follow-up activities.

<b>Feelings after training</b> (not needed)	Nice experience, so beneficial
<b>Communication</b> with RENAC/Sendea staff, including information given	4,3
<b>Guidance</b> throughout the process and <b>moderation</b> during the training	4,0
<b>Programme</b> , including structure, interactive elements, timeframe, topics variety	4,3
Personal <b>exchange</b> and <b>networking</b> opportunities	4,6
Training / Event <b>location</b>	4,3
Quality of <b>catering</b>	4,4
What did you <b>like most?</b> (text)	lecturer, program guidance, networking, site visits, practical, boosting social capital, communication, understandable
What could be <b>improved?</b> (text)	More time at the station/grid installation, longer training period, more time for hands-on training, more equipment for practical exercises
<b>Expectation</b> fulfilment	4,6
Would you <b>attend</b> a training with BGFA <b>again?</b> (% of yes)	100,0
<b>Average</b>	<b>4,4</b>

Example of feedback survey report (scale 0-5)



Extract from a Mentimeter feedback survey

### 3.1.2 Training centres

Concerning training locations for the face-to-face training modules, the courses were held close to the location of the ESPs to reduce travel costs and facilitate a higher number of participants.

### Solar home systems component

#### Nakawa Vocational Training College (VTC):

The Nakawa Vocational Training Center is one of the leading vocational education institutions in the country. Of particular interest is the Nakawa VTC SHS training facility (Solar Lab), for technical training on photovoltaic solar energy with good solar training equipment available.

#### Ndere Cultural Centre:

Ndere Cultural Centre is an African cultural hub that expands over 9 acres of well-maintained African flora and fauna. It is characterised with indigenous architecture given a modern and fresh look. The facilities are comfortable, spacious, well-equipped and have a clear cultural and multi-disciplinary focus.

### Mini-grids component

As for the hands-on mini-grids trainings, the **mini-grid developed by Volt-Terra in Uganda** as a joint venture with INENSUS GmbH was ideal. This 60 kWp solar PV mini-grid located in Nsambya, a community around 1.5hrs drive north of Jinja, provided an excellent example of a successful ongoing mini-grid business case.



Mini-grid asset pictures

#### 3.1.3 List of trainings conducted

Type	Training	Dates	Participants	Women
In-person	Sales and Interpersonal skills in the solar industry	10th-13th October 2023	23	7
In-person	Quality Assurance and Management of SHS	31 <sup>st</sup> October-2 <sup>nd</sup> November 2023	13	2
Online	Commercial aspects of solar mini-grids	30 <sup>th</sup> October-1 <sup>st</sup> November 2023	13	1
In-person	Project Management and Business Finance on Solar Solutions	8 <sup>th</sup> – 10 <sup>th</sup> November 2023	20	8
In-person	Installation and commissioning + O&M and remote monitoring of solar mini-grids	13 <sup>th</sup> - 17 <sup>th</sup> November 2023	12	1
In-person	O&M, testing and repair of SHS + Installation and commissioning and Health and Safety	27 <sup>th</sup> November-1 <sup>st</sup> December	12	1
Online	Business models and investors’ guidelines for mini-grids (“financial models”)	26 <sup>th</sup> – 28 <sup>th</sup> March 2024	10	4
In-person	Managerial and interpersonal skills	8 <sup>th</sup> - 12 <sup>th</sup> April 2024	22	14

List of conducted training, first round

Type	Training	Dates	Participants	Women
Online	Distribution network design of mini-grids	27 <sup>th</sup> – 30 <sup>th</sup> May 2024	6	1
In-person	Decentralized renewable energy solutions business models	4 <sup>th</sup> – 6 <sup>th</sup> June 2024	22	7
In-person	E-waste management	11 <sup>th</sup> – 13 <sup>th</sup> June 2024	15	5
In-person	Hands-on technical training on mini-grids	24 <sup>th</sup> – 27 <sup>th</sup> June 2024	12	2
In-person	Hands-on technical training on SHS, in Gulu	2 <sup>nd</sup> – 5 <sup>th</sup> July 2024	13	2
In-person	Trouble shooting and repairs of SHS	22 <sup>nd</sup> – 24 <sup>th</sup> July 2024	12	2
In-person	Train-the-Trainers programme: Women in Solar Business in Uganda	19 <sup>th</sup> – 23 <sup>rd</sup> August 2024	16	16
In-person	Online course: Sales and post sales best strategies in the solar off-grid industry	28 <sup>th</sup> August - 6 <sup>th</sup> October 2024	21	8
In-person	Quality aspects and best technical practices of SHS solutions	9 <sup>th</sup> - 12 <sup>th</sup> September 2024	14	5
Online	Crash course on mini-grids: project developers	17 <sup>th</sup> - 19 <sup>th</sup> September 2024	7	1
Hybrid	Agro-processing with mini-grids	23 <sup>rd</sup> - 24 <sup>th</sup> September + 1 <sup>st</sup> October 2024	24	3
In-person	Marketing and Best Sales: solar off-grid	7 <sup>th</sup> – 11 <sup>th</sup> October 2024	26	10

List of conducted training, follow-up round

## 4 Project outcomes and main take-aways

### 4.1. Key Achievements

The main achievements can be summarised as follows:

- 1. Diverse Trainings Delivered:** Over 20 training sessions were successfully conducted, addressing both technical and business skills across two critical components: solar home systems (SHS) and mini-grids. This ensured that participants gained a balanced understanding of technical implementation and strategic business modelling, tailored to the needs of Uganda’s off-grid solar market.
- 2. Participant Engagement:** A total of 313 participants were trained, surpassing the program's initial participation targets. Of these, 32% were women, reflecting strong progress toward gender inclusivity.
- 3. Breadth of Focus:** The training themes covered a wide spectrum, ranging from quality assurance of SHS to business modelling for decentralized renewable energy solutions. This comprehensive approach ensured that participants developed both the technical expertise and entrepreneurial skills necessary to drive innovation and growth in the sector.

- 4. Flexible and Tailored Training Program:** The program adopted a highly adaptable structure to meet the varying training needs and schedules of participating companies and individuals. This flexibility was instrumental in achieving high attendance and engagement while addressing the unique challenges of Uganda’s dynamic solar energy market.
- 5. Gender Inclusion:** A strong emphasis was placed on integrating a gender perspective into the program. Women were not only encouraged to participate but also took active roles as trainers and content developers. These efforts exceeded gender inclusion targets, helping to promote women’s leadership and visibility in Uganda’s renewable energy sector.
- 6. Certification and Professionalization:** All participants who successfully met the course requirements were awarded certificates of completion. These certifications enhance employability and contribute to the ongoing professionalization of Uganda’s solar off-grid market, positioning the country’s workforce as a key driver of sustainable energy solutions.

#### 4.2. Participant Targets

The project had ambitious participation targets considering the different profiles of the participating companies: 300 participants in the courses, with a minimum of 30% women. The skilling programme was also open to other relevant actors in the renewable energy sector.

In the end, thanks to both training rounds, these targets were reached and even exceeded, with a total of **313 participants**. Among them, **100 women, 32%** of the total number of participants. Following the main numbers:

Training Type	ESP	Non-ESP	Total	Women	% Women
Sales and Interpersonal Skills-solar industry	15	8	<b>23</b>	7	30%
Quality Assurance and Management of SHS	13	0	<b>13</b>	2	15%
Commercial aspects of solar mini-grids	12	1	<b>13</b>	1	8%
Finance and Project Management	13	7	<b>20</b>	8	40%
Installation and commissioning + O&M and remote monitoring of solar mini-grids	11	1	<b>12</b>	1	8%
O&M, testing and repair of SHS + Installation and commissioning and Health and Safety	11	1	<b>12</b>	1	8%
Business models and investors’ guidelines for mini-grids (“financial models”)	10	0	<b>10</b>	4	40%
Managerial and interpersonal skills	19	3	<b>22</b>	14	64%
Distribution network design of mini-grids	5	1	<b>6</b>	1	17%
Decentralized renewable energy solutions business models	3	19	<b>22</b>	7	32%
E-Waste management and disposal	7	8	<b>15</b>	5	33%
Hands-on training on mini-grids	3	9	<b>12</b>	2	17%
Technical considerations hands-on training on SHS, Gulu	4	9	<b>13</b>	2	15%
Trouble shooting and repairs of SHS	4	8	<b>12</b>	2	17%
T-t-T Women in Solar Business in Uganda	12	4	<b>16</b>	16	100%
SHS Best practices, technical training	3	11	<b>14</b>	5	36%
Crash course on mini-grids: project developers	6	1	<b>7</b>	1	36%

Agro-processing with mini-grids	6	18	<b>24</b>	3	13%
Online Sales and post sales	21	0	<b>21</b>	8	38%
Marketing an Best Sales	5	21	<b>26</b>	10	38%
<b>Total</b>	183	130	<b>313</b>	100	<b>32%</b>

Participation final numbers

### 4.3. Other relevant take-aways

Beyond the quantitative achievements, the skills development programme has yielded several significant qualitative outcomes that reflect its broader impact. This section presents those key takeaways, highlighting the transformative effects on participants’ knowledge, skills, and the project’s gender approach.

These outcomes not only underscore the programme's success in meeting its objectives but also demonstrate its contribution to the long-term growth and sustainability of the solar off-grid sector in Uganda.

#### 4.3.1. Technical Skills Development

##### Solar Home Systems (SHS)

- **Focus on Quality:** Training on quality assurance emphasized the need for rigorous quality control and awareness of international and national standards on solar off-grid solutions and the different component and equipment within the solar industry. Participants reported improved skills in assessing the performance of SHS components such as batteries and inverters, addressing Uganda's challenges with substandard solar products.
- **Practical Sessions Enhance Understanding:** Hands-on exercises in Solar home systems and mini-grids installation and maintenance significantly increased participant confidence in handling technical tasks, especially among engineering team leaders.
- **Systematic Approach:** Emphasis on using proper tools and adhering to measurement protocols provided participants with a structured approach to managing SHS quality and avoid risky practices and hazardous management of the various components.

##### Mini-Grids

- **Holistic Training:** Sessions on mini-grid installation and remote monitoring covered end-to-end processes, including commissioning, operations, and business model implications. This approach provided participants with both technical and commercial perspectives.
- **Best practices:** the trainers' field know-how and the involvement of the ESP staff working with the mini-grid provided added value in the area of best practices regarding the installation and commissioning of solar mini-grids.
- **Remote Monitoring Adoption:** Training introduced advanced software tools (e.g., SMA, MPM) for monitoring, which was particularly appreciated for improving operational efficiency in remote, rural and peri-urban areas.

##### Distribution Network Design

- **Addressing Bottlenecks:** Participants learned strategies for designing efficient and resilient mini-grid distribution networks, addressing a critical bottleneck in the development of Uganda’s off-grid infrastructure.

#### 4.3.2. Business and Soft Skills Enhancement

##### Sales and Interpersonal Skills

- **Customer-Centric Approaches:** Training emphasized the importance of understanding customer needs and tailoring solutions, which participants identified as a gap in their prior practices. Role-playing exercises helped develop these skills. Counting with leading experts in these aspects in the social sciences was a very positive reinforcement in the transmission of these learning objectives.
- **Building Trust and Ethical Practices:** The focus on transparency, ethical pricing, and after-sales service was seen as essential for building consumer confidence in solar products. The online course played a pivotal role on addressing these sensitive issues inherent to BGFA's programme.

##### Financial Management and Business Models

- **Strategic Insights:** Participants gained skills in using the Business Model Canvas (BMC) to refine business strategies. This was particularly valuable for small companies struggling with growth. The sessions on best practices in sales and post-sales were also very fruitful for the professionalisation of the solar off-grid sector.
- **Investment Readiness:** The masterclass on raising investment for decentralized energy solutions helped participants understand investor expectations and prepare more compelling business cases. The course designed to raise awareness of investment opportunities in solar mini-grids equipped participants with a comprehensive understanding of all the aspects on project, enabling informed decision-making. Thus, fostering confidence, encouraging the mobilization of capital into this growing sector and ultimately promoting sustainable development.

#### 4.3.3. Gender Inclusion

##### Women in Solar Business

- **Empowerment Through TtT:** the specialized Train-the-Trainers programme for women achieved 100% female participation and certification, equipping 16 women with the skills to train others in technical, commercial, and financial aspects of the solar sector. This multiplier effect was highlighted as a critical outcome.
- **Overcoming Gender Barriers:** Participants appreciated discussions on work-life balance and strategies to address gender inequalities in the sector. This encouraged more proactive engagement by women in leadership roles, thus promoting a more equitable, fair and therefore sustainable solar off-grid sector in Uganda.
- **One third women participation:** this rate is particularly impactful in a predominantly male sector, highlighting the programme's success in promoting gender diversity. This progress underscores the importance of continued efforts to create an equitable and diverse workforce, driving sustainable growth and enhancing the sector's innovation and adaptability

#### 4.3.4. Sector-Specific Learnings

##### E-Waste Management

- **Critical Awareness:** Participants highlighted the importance of managing e-waste, particularly the handling of batteries at the end of life. Training on the "GOGLA Circularity Toolkit" provided actionable strategies for companies and the coordination with dss+ and BGFA goals on this regard was extremely positive.



- **Stakeholder Collaboration:** The inclusion of key stakeholders in e-waste management processes emphasized the need for collective efforts to address this growing challenge and contributes to a more inclusive approach of the different levels of the workforce of each company on this topic.

#### **Agro-business with Mini-Grids**

- **Value Chain Integration:** Training demonstrated how mini-grids could enhance rural industrialization by integrating with agricultural processing value chains. This was seen as a transformative approach for rural communities with a great potential for transformation in the productive and social structure of large parts of the country.
- **Business Matchmaking:** Sessions on matchmaking agricultural processing businesses with mini-grid developers also opened new avenues for collaboration and innovation.

#### **4.3.5. Lessons Across All Trainings**

The implementation of this programme has yielded significant insights that extend beyond the immediate outcomes of participation and qualitative takeaways. These cross-cutting lessons provide valuable guidance for future initiatives, highlighting both the successes and challenges encountered throughout the project. These experiences form the main aspects that influence the effectiveness of similar programmes and identify opportunities for improvement, innovation, and scalability in the solar off-grid sector.

##### **1. Tailored Training Increases Impact:**

- Customized content addressing specific needs ensured relevance, particularly in niche areas like mini-grid distribution design and e-waste management.
- This approach allowed participants to gain targeted knowledge and skills that directly applied to their roles, increasing the overall effectiveness of the training.
- Tailoring also helped address regional variations and specific organizational challenges, making the training more applicable and impactful.

##### **2. Hands-On Learning is Crucial:**

- Practical sessions, such as troubleshooting Solar Home Systems (SHS) and using monitoring software for mini-grids, enhanced skill retention and applicability.
- These sessions provided real-world experience, enabling participants to better understand the technical complexities and operational challenges.
- Hands-on learning bridged the gap between theory and practice, ensuring that participants could confidently apply their skills in their work environments.

##### **3. Inclusive Participation is Beneficial:**

- Bringing together diverse participants, including Energy Service Provider (ESP) staff, free agents, and external stakeholders, fostered knowledge exchange and broader sector impact.
- This diversity encouraged the sharing of different perspectives and experiences, enriching the learning environment.
- Inclusive participation also helped build stronger networks and collaborations within the sector, promoting a more integrated and supportive community.



#### 4. Gender Balance Requires Continuous Effort:

- Although gender inclusion goals were met in some areas, continued focus is needed to ensure sustained participation of women across all training types.
- Initiatives to encourage female participation, such as targeted outreach and support programs, should be maintained and expanded.
- Achieving gender balance contributes to a more equitable and innovative sector, especially in a male dominant solar industry, benefiting from a wider range of talents and viewpoints.

#### 5. Follow-Up Mechanisms Are Essential:

- Participants expressed the need for ongoing support to implement skills, including refresher sessions and further monitoring of practical applications.
- Follow-up mechanisms such as mentorship programs, peer-to-peer learning groups, and online resources can help sustain and deepen the impact of the training.
- Continuous support by the ESP ensures that the skills and knowledge acquired are effectively applied, leading to long-term improvements in performance and outcomes.

#### 6. Accredited Certification Adds Value:

- The issuance of an accredited certificate by RENAC AG was highly valued by participants, boosting their personal assessment of the programme and enhancing their career prospects.
- Accreditation provided formal recognition of the skills and knowledge gained, increasing the credibility and marketability of participants.
- It also plays a critical role in the professionalization of the sector by fostering credibility and trust in the workforce, encouraging higher standards and consistent quality across the industry.

### 5. Testimonials and success stories

- ✓ Testimonials website: <https://www.renac.de/renac/renac-news/sharing-the-accomplishments-of-bgfa-uganda-skill>
- ✓ Project's testimonials website: <https://www.renac.de/projects/current-projects/bgfa-uganda-solar-off-grid-skills-development-programme>



“My most insightful part was when the trainer, Jens explained further the I-V and Power relationship and demonstrated it practically as we measured the PV module's behaviour in different configurations. I have gained new and advanced on my knowledge. I believe this will greatly improve my work quality and delivery.”

Jaco Wokorach, R&D Associate, Mandulis Energy



“I participated in the program to enrich my skills in solar PV, get to know the safety practices when installing systems and this has helped strengthen my understanding of solar energy systems. I would recommend Renac because of skilling and efficiency in training”

Emmanuel Muhumuza, Sales Lead Team, SunCulture UG Ltd

“The well thought programs exceeded my expectations. From the 2 trainers all with a wealth of knowledge, introduction to the site Visit in Nsambya, I learned new valuable insights into solar Mini Grids. The training was innovative, informative, and instructive. It expanded our minds and connected us to new Mini Grid Ideas”

Dan Kalyango, Quality Assurance Manager, D.Light Design



The hands-on workshops and in-depth sessions on solar technology applications were the most enlightening aspects of the training. This experience has significantly enhanced my professional endeavors by arming me with practical skills that I have already utilized in my role, resulting in more efficient and successful project executions

Eric Adweko, BrightLife Uganda

## 6. Conclusion and recommendations

### 6.1. General conclusions

The BGFA Uganda skills development programme has significantly contributed to the development of the off-grid energy sector by equipping participants with key technical, business and interpersonal skills. The programme's focused on practical, tailor-made, market-relevant trainings on both Solar home systems, which are crucial to achieving BGFA Uganda's rural electrification and SDG 7 targets.

With a focus on previously identified capacity needs, the programme offered two rounds of 20 diverse and relevant trainings for the professional development of the participants. This helped to exceed participation targets, with 313 certificates issued, 32% of them women, and with the active participation of other relevant Uganda energy professionals.

The tailored design of the whole training programme, featuring diverse training formats, locations, and scopes, equipped participants with knowledge and skills directly relevant to their roles, significantly boosting the programme's overall impact. By addressing the different ESP's specific organizational and business needs, regionals disparities and workforce profiles, the training became even more relevant and fruitful.

Practical, hands-on learning was highly valued by the participants as they offered them real-world experiences, ensuring their ability to confidently implement acquired skills in their professional settings. Moreover, bringing together a diverse group of participants, including staff from various Energy Service Providers (ESPs) and external energy companies' staff and independent professionals, facilitated valuable knowledge exchange and amplified the programme's impact across the sector.

Networking sessions and interpersonal and business-oriented modules enriched the learning process and strengthened networks among the participants. Such collaborative efforts contribute to a more interconnected industry and supportive community, which is essential for the long-term development of the off-grid energy sector.

Furthermore, the issuance of an accredited certificate by RENAC AG was highly valued, boosting participants' personal assessment of the programme and enhancing their career prospects. Accreditation provides formal recognition of the skills and knowledge gained, increasing the credibility and marketability of participants. This also plays a critical role in the professionalization of the sector by fostering credibility and trust in the workforce, encouraging higher standards and consistent quality across the industry.

The programme was built around a commitment to gender inclusion, with proactive measures to integrate a gender perspective into the training design and promoting a greater participation of women.

By encouraging women to take on leadership roles in the solar market and involving them as trainers and content developers, the programme surpassed its gender inclusion targets, contributing to a more inclusive and equitable renewable energy landscape in Uganda. However, while significant progress was made, continued efforts are essential to ensure the sustained participation of women across all training types. Expanding initiatives such as targeted outreach and support programmes will be key to fostering greater female involvement, achieving gender balance, and unlocking diverse talents and perspectives that drive innovation and growth in the traditionally male-dominated solar industry.

Finally, participants also expressed the need for ongoing support to implement their newly acquired skills, highlighting the importance of follow-up mechanisms such as mentorship programs, peer-to-peer learning groups, and online resources. Continuous support to ESPs would ensure that the skills and knowledge gained are effectively applied, and continued efforts to scale these learnings will lead to long-term improvements in performance and outcomes, thus contributing to achieve BGFA's targets and Uganda's off-grid electrification goals.

## 6.2. Recommendations and way forward

Based on the acquired experience from this project, the Consultancy team recommends the following:

- **Focus on Follow-Up:** Implement structured follow-up sessions to monitor how skills are applied in practice in a longer term. This, within and by the energy-service-providers internally. Continuously refine programmes based on participant and stakeholder feedback.
- **Mini-grids and productive use of energy training:** given certain saturation of SHS projects, focusing on untapped market opportunities in solar mini-grids and energy applications for productive use. Deliver targeted training to raise awareness about their potential to diversify energy access and stimulate economic development.
- **Promote further Women-Specific Training:** Offer modules tailored to the unique challenges women face in the sector, to boost representation further. This including specific trainings in gender perspective and entrepreneurship mentoring programmes for women only
- **Internal Accreditation System:** support in the implementation of an accreditation system to professionalize the sector, ensuring recognition of skills and expertise. If national implementation is not feasible, prioritize the integration of internship programmes within the company framework to support hands-on learning and professional growth.
- **Leverage Partnerships:** Strengthen collaborations with companies and external stakeholders for ongoing capacity-building initiatives. Also, raise awareness among companies on importance on continuous training as a key corporate policy.
- **Expand Regional Reach:** Introduce training hubs in other (remote) areas to increase accessibility for external participants from rural regions and further districts in Uganda, regardless of the location of companies' main activities.

This, also including the **replication of this skilling programme in other focal countries of BGFA**, to expand the benefits in terms of sustainable and inclusive market development to those other markets BGFA is active on.