

February 2022



Unlocking support for local clean energy companies: insights from the solar PV industry in Uganda



Authors List:

Julius Magala¹, Eddie Sembatya², Lynda Bitete², Padmasai Lakshmi Bhamidipati³, Mathilde Brix Pedersen³

¹Independent consultant, ²Finding XY, ³UNEP DTU Partnership

ISBN: 978-87-93458-10-9

UNEP DTU Partnership

Copenhagen, Denmark

www.unepdtu.org

Graphic Design: Fabrice Belaire and Julius Magala

Photo credit: cover - UNCDF/USEA; sections 1, 2, 3 - Shutterstock; section 4 - <http://epicenterafrica.com/gallery/>; section 5 - <http://allintradelimited.com/>

Disclaimer:

The views expressed in this publication are those of the authors. We regret any unwitting errors or omissions. This publication may be reproduced in part or in any form for educational or non-profit services without special permission from the copyright holder, provided acknowledgement of the source is made. No use of this publication may be made for resale or any other commercial purpose whatsoever without prior permission in writing from the UNEP DTU Partnership.

Acknowledgements

The authors of this report would like to extend a special thank you to the participating company representatives and to the investors, sector experts, government officials and reviewers who have contributed through interviews, discussions and dialogue sessions as well as with feedback to this report:

Ugandan solar company representatives: Alex Karinkiiza (Solar Today), Emmy Kimbowa (Energy Systems), Waringa Matindi (Village Energy), Kalyango Mohammed (Kambasco Technologies), Sophie Mparawe (Eye Power Technologies), Lubowa Muhammad (All in Trade), Francis Namudenyi (Eye Power Technologies), Harriet Nongoola (Xpreme Solar), Yusuf Sebuma (Victron Solar Company), Abdallah Sekitoleko (E-Power Solutions), Andrew Ssentongo (GRS Commodities), Tony Ssimbwa (Power Trust), Joseph Wanume (Access to solar), and Frank Neil Yiga (Anuel Energy)

Government officials and Industry Associations: Alexander Akena (UNREEEA), Dr. Brian Isabirye (MEMD), Stephen Kirya (MTIC), Loy Kyozaire (Sendea), Atwine Mathias (MTIC), Dr. Joshua Mtambi (MTIC), Ismail Muyinda (USEA), Richard Mwesigwa (USEA), and Veronica Namwanje (USSIA), Mr. Wafula Wilson (MEMD)

Sector experts and Financiers: Moses Abuce (NUCAFE), Eng. Dennis Ariho (EACREEE), Sarah Fortunate (UDBL), George William Kiyingi (Post Bank), Jo Kirungi (Open Capital), Lawrence Lubega (Centenary Bank), Perez Magoola (Open Capital), Keru Munene (Open Capital), Fred Tuhairwe (GGGI), and Ash Sharma (NEFCO)

Thanks also for project support, input and feedback to: Barbara Akello (Finding XY), Lynda Bitete (Finding XY), James Haselip (UNEP DTU Partnership), Julius Magala (UNCDF), Prever Mukasa (Finding XY), Ivan Nygaard (UNEP DTU Partnership), Ulrich Elmer Hansen (UNEP-DTU Partnership), Paul Riemann (UNEP DTU Partnership), and Eddie Sembatya (Finding XY)

Background: About UNEP-DTU Partnership: TEMARIN Project

The **TEMARIN** project is a three-year, **DANIDA** (Danish Development Cooperation) funded project covering the countries of Kenya and Uganda with the overall aim to support countries in accelerating the transfer, diffusion and uptake of specific climate technologies.

MAIN COMPONENTS OF TEMARIN

1

Generate relevant **knowledge products and highlight cases of market-led diffusion and market potential of climate technologies** including small-scale irrigation, captive solar PV and ICT based agricultural extension services in Uganda.

2

Generate a **better understanding of the role and growth patterns of domestic solar PV companies/SMEs**, profiling them, and identifying critical challenges (in Kenya and Uganda), and co-creating ideas and their implementation to strengthen support for domestic PV industry

3

Facilitating and enabling partnerships to increase the uptake of select climate mitigation and adaptation technologies in Uganda

CONTENTS OF THIS REPORT

01

Introduction

Introduction to the research | Report methodology

02

Key Findings

Characteristics of domestic solar companies | Solar PV market segments | Business models
Supply and demand for finance | Growth trajectories

03

Constraints for continued business growth and solutions

Summary of key constraints | Deep dive into access to finance and managerial and financial skill-gaps

04

Conclusions and recommendations

Concluding the report findings | Recommendations to address key challenges | Recommendations to stakeholder groups

05

Appendix



01

Introduction

Introduction to the research | Report methodology

1.1 Introduction

In Sub-Saharan Africa (SSA), electrification through decentralized renewables-based solutions (particularly solar PV) has advanced significantly over the past decade. Going forward, this transition to clean energy has a significant potential in addressing integrated challenges including access to energy, job creation, skills development and local economic development (IRENA, 2019, 2020).

Maximizing local benefits from this clean energy transition is important for the host countries in order to achieve SDG 7 goals, to sustain a longer-term commitment to low-carbon development pathways (IRENA, 2018), and not least to recover in a post-COVID reality (SE4ALL 2020).

In Uganda, there are over 300 solar companies with a majority being locally owned (UOMA, 2020). Despite a high number of locally owned companies, there is little information available about these companies, their strategies and growth journeys, how they contribute to this sector and not least how they can be better supported.

Much of the growth and economic value in the market is being captured by a relatively small number of internationally owned companies operating in SSA countries (Wood Mackenzie, 2020, UNEP-DTU, 2021). According to GOGLA, in 2020 75% of the funds were raised by only 3 companies. International flows of finance, skills and technology are important to ensure growth of the solar industry, but equally important is ensuring that local solar companies have access to equal opportunities for growth and that their plight is understood and needs are addressed to strengthen the local economy.

Against this background, this report sheds new light on some of the Ugandan-owned companies, provides insights on how they operate and grow, what barriers and constraints they continue to face, and ways in which support for these companies could be strengthened.

1.2 Introduction

The aim of this report is to generate new knowledge about domestic companies operating in the solar PV sector in Uganda and to contribute to a discussion of how to increase the domestic share of the solar market.

THE SPECIFIC OBJECTIVES OF THE REPORT ARE TWO-FOLD

- To profile and generate a better understanding of domestic solar PV companies.
- To identify critical challenges and possible solutions to strengthen support for domestic solar PV industry.

KEY QUESTIONS ADDRESSED

- What are the characteristics of domestic solar companies?
- How have these businesses grown and continue to grow?
- What are the main barriers to the scaling of the business activities and how can the identified barriers be reduced?

1.3 Report Methodology

The report findings were developed by carrying out literature review of relevant reports, combined with stakeholder consultations.

Primary data collection was undertaken through interviews with a sample of domestic companies and sector experts **(see Appendix A for list of interviewed stakeholders)**. In addition, the preliminary findings were validated through a stakeholder co-creation workshop. In addition, an investor workshop was also organized in February 2022 to increase the flow of investments to local solar companies. The workshop witnessed participation and engagement by a number of organisations including PFAN, Bettervest, igravity, Inua Capital, Solar Aid Limited, UNFCCC, FSD Uganda, Sendea, Equity Bank, Post Bank, Alliance for Rural Electrification, and Renac.

LITERATURE REVIEW & SELECTION	KEY STAKEHOLDER INTERVIEWS	STAKEHOLDER VALIDATION
March 2021	April- July 2021	October 2021
<ul style="list-style-type: none"> Literature review of MSME and solar PV sector policies and regulations, reports and market maps. Mapping of domestic companies (36) Selection of domestic companies. (15) 	<ul style="list-style-type: none"> Interviews (13) with domestic solar companies Additional interviews (6) with stakeholders 	<ul style="list-style-type: none"> Attended by Government and private sector (20 participants) Shared preliminary findings Co-creation of solutions Way forward

1.4 Report Methodology

The authors used the following selection criteria to determine which solar companies to interview:

- At least 70% of the shareholders should be Ugandan nationals. The company should also be managed by a Ugandan national.
- The company should have been in operation for 5 or more years at the time of the interviews.

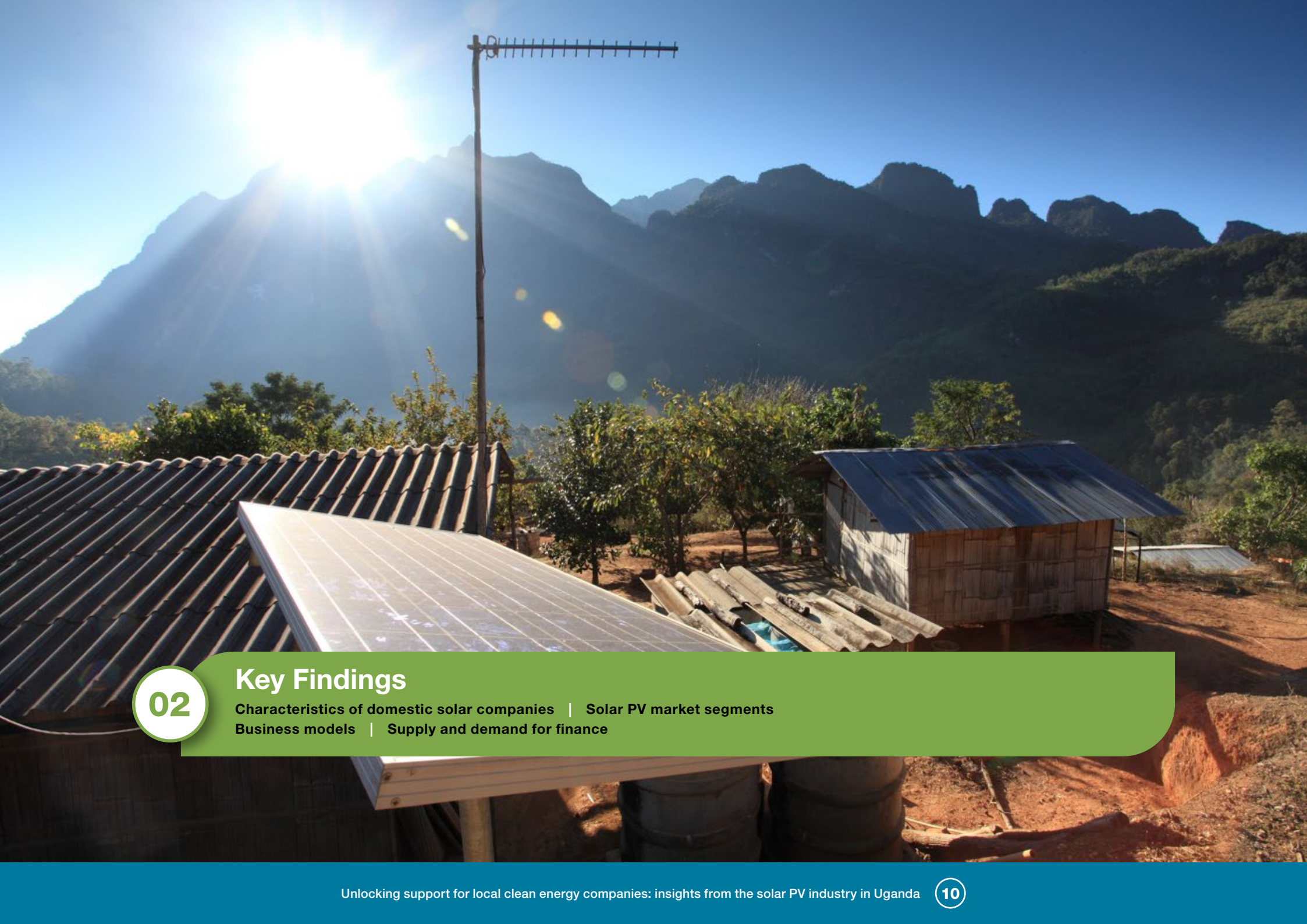
The portfolio of shortlisted companies was screened further to ensure that the final sample represents companies operating across various solar market segments including off-grid, mini-grid, productive use and captive solar PV. The final sample was also subject to the availability of the directors/managers for interviews and verification of data.

Subsequently, 10 companies are featured in the report. **(see Appendix B for a list of company profiles). The authors refer to these companies as ‘domestic’ or ‘local’ interchangeably.**

Prior to the interviews, authors reviewed secondary data including market studies and sector reports to identify the domestic companies, key players and ongoing initiatives in the solar PV industry. Some of the reports reviewed are published by organisations such as Ministry of Energy and Mineral Development, IRENA, SEforAll, UNEP, USEA, Energy 4 Impact, GOGLA, UBOS among others

To generate insights for the report, key informant interviews were conducted both virtually and physically with owners/managers of the domestic companies and representatives from ministries, regulatory bodies, and financial institutions. The findings from the literature review and interviews were shared and discussed during an in person co-creation workshop held in Kampala.

Lastly, there were limitations in data availability and accessibility, and in some instances, authors had difficulties in obtaining clear and verifiable information from the companies.






02

Key Findings

Characteristics of domestic solar companies | Solar PV market segments
Business models | Supply and demand for finance

2.1 Characteristics of domestic companies (age and size)

COMPANY 	AGE 	N° OF STAFF 
Access to solar	05	05
Anuel Energy	06	14
Xpreme Solar Solutions	07	12
Kambasco Technologies	09	06
Solar Today	09	24
Power Trust	10	16
GRS	11	11
E-Power Solutions	12	12
All in Trade	13	25
Victron Solar	19	11

Access to solar is the youngest company with 5 years in operation while **Victron solar is the oldest** with 19 years in operation. Xpreme Solar solutions is the only female owned and led organisations among the interviewed solar businesses. The majority of the companies have been in operation between 9 to 19 years.

The ten solar companies **employ between 5 - 25 full time staff** hence categorised as medium enterprises as they employ less than 50 employees as defined by Uganda Bureau of Statistic (UBOS)⁵. The total number of full time staff employed is **130** who are working covering the roles of management, operations, technical services and after sales support.

The female full time employment rate is 35% which is higher than the global average for the renewable energy sector which is 32%. (Power for All, 2019).

Due to closure of non-essential business in order to reduce the spread of the COVID- 19, local solar businesses laid off staff in order to cope with the pressure of reduction in revenues. For example Solar Today laid off 10 staff.

Domestic solar companies have been in operation for 5 to 19 years, fall in the category of medium-sized enterprises and employ mostly male employees.

2.2 Characteristics of domestic companies (educational and work background of owners)

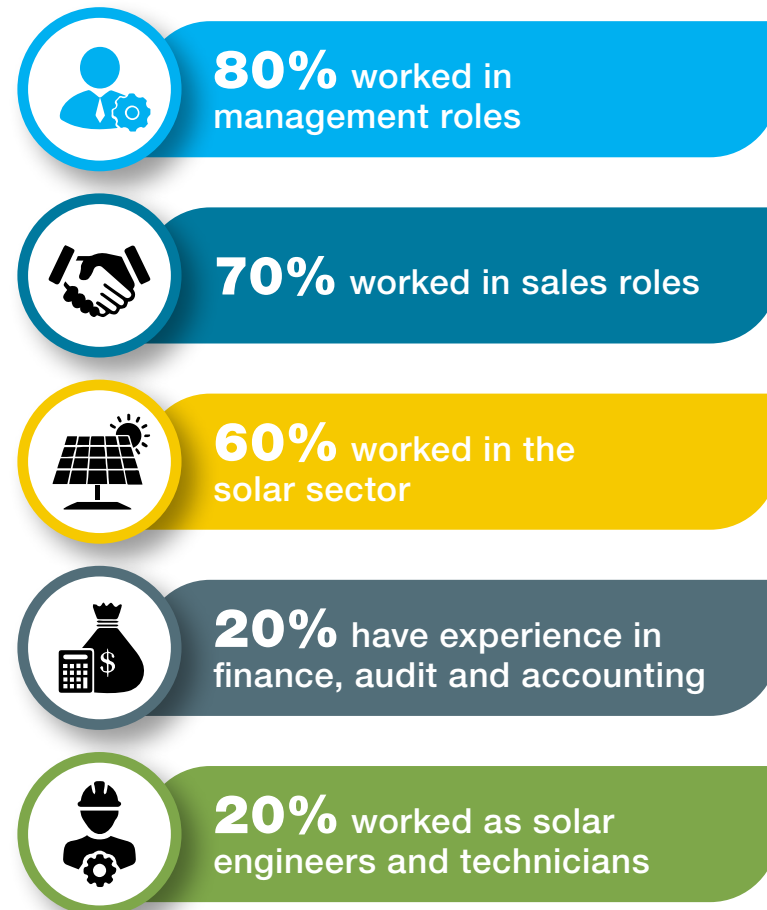
All the company **owners** hold **bachelors degrees** in business, project management, social sciences, ICT, engineering, agriculture and education from Ugandan and international universities.

There are only 3 (All in Trade, Solar Today, and Kambasco technologies) out of the 10 owners have received specialised training in renewable energy technologies, renewable energy management and finance, Solar Pv design, installation and maintenance from Renewable Energy Institute-UK, Heriot- Watt University and Solar Village in Bavaria. This training has helped deepen their understanding of the solar technologies and improve management of their businesses.

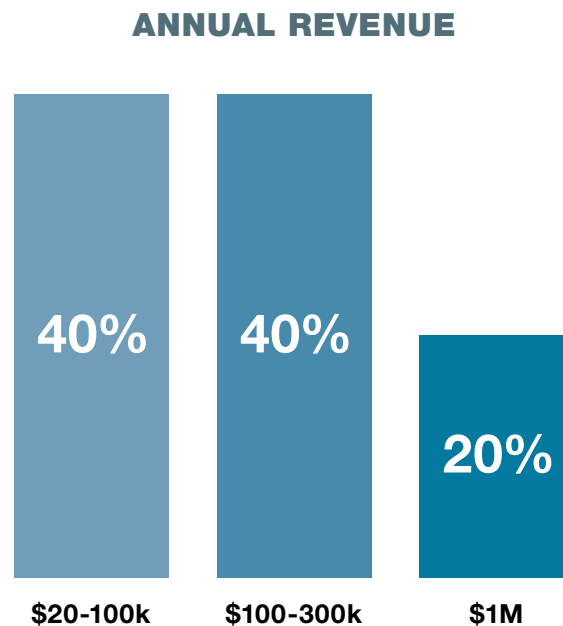
In terms of prior work experience, owners **have worked for an average of 5 years** before starting or managing a solar business. They worked primarily in the solar industry, in oil and gas, and in telecommunications. The majority have worked in management and sales roles. Further, 4 companies have specialized experience: 2 companies (Xpreme Solar solutions and Kambasco technologies) have experience in finance, audit and accounting, and further 2 companies (E-Power solutions and Power Trust) have experience in solar PV engineering, design, and installation.

Previous exposure and working experience in the solar sector motivated owners to start their solar businesses. However, capacity limitations exists in specialized areas such as: designing PV systems, operations and maintenance, accountancy and financial management.

PREVIOUS WORK EXPERIENCE



2.3 Characteristics of domestic companies (revenues)



Local solar companies generate revenues from sales, distribution, installation and maintenance of solar products, systems, and appliances such as televisions, fridges, water pumps - for household, institutional and business use and electrical installations. Additional ways in which companies generate revenues are through sale of electricity service from solar mini-grids (e.g. GRS), and also from solar technical trainings and offering consultancy services.

The annual revenue for 2019 ranges from \$ 20k to \$ 1 million. The average annual revenue for 2019 was **\$320k**.

The majority (80%) of the companies have a turnover between \$20k to \$ 300k and a few (20%) have a turnover of more than \$1 million.

Disclaimer: The annual revenues are self reported by the companies, hence not verified based on audited financial statements.

2.4 Solar PV Market Segments (1)

Company Name	Pico products and SHS	Stand-alone Institutional systems	Captive systems	Mini-grids	Others
Access to Solar	●	◐			None
All in Trade	◐	●	●	◐	Streetlights, power backups, water pumps, water heaters, fridges, wind turbines and power protection devices
Anuel Energy	●	●			Water pumps, fridges, barber kits, electrical wiring and digital platform.
E-Power Solutions	◐	●	◐		Generators, water heaters, streetlights, fridges, electrical wiring
GRS			●	◐	Mini-grid and cold chain management consultation
Kambasco	●	◐			Credit assessment software, technical training, energy audits, e-bikes
Power Trust	●	◐	◐		Fridges, mills, electrical appliances, and wiring
Solar today	●	◐			Water pumps, streetlights, energy audits, electrical wiring
Sunny Money	●	◐			None
Victron Solar	●	●	◐		Hybrid solutions, energy efficiency

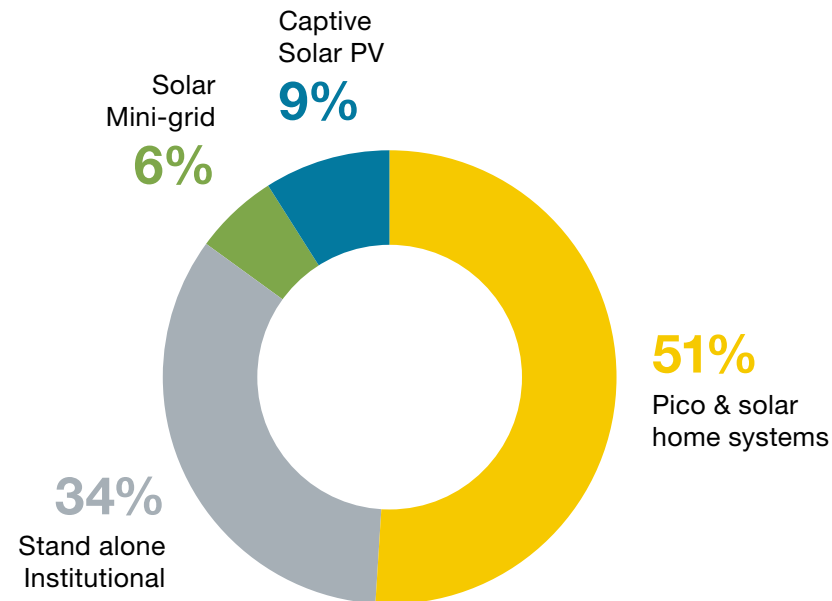
● PRIMARY MARKETS ◐ SECONDARY MARKETS

The primary market is a key target market where the company sees high potential to sell, has most experience serving and generates most of its revenue while **secondary markets** are those where business have identified less opportunities to sell or new markets that they are expanding into.

From this table, we find that the majority of domestic solar companies are mainly serving customers in the pico solar, solar home systems and standalone institutional solar markets. Only 2 companies focus on the captive market as a primary market, while 3 companies serve it as a secondary market. 2 companies focus on the mini-grid market as a secondary market.

Domestic solar companies also provide a range of other products and services which are complementary to solar such as electrical installations, consultancy, training and selling energy efficient appliances.

2.4 Solar PV Market Segments (2)



The figure shows the four main types of markets that the domestic solar companies operate in. The majority (51%) of customers buy pico solar and solar home systems used for lighting, listening to radio, watching Tv and refrigeration. This is followed by the standalone institutional solar products (34%) targeting institutions such as schools, religious entities and businesses who buy the solar system for lighting, phone charging, radio and TV but also use solar for powering appliances such as fridges for business use and health centres, water pumps and computers for commercial use. Captive solar PV customers who use it for commercial and industrial purposes and those with access to electricity via solar minigrids represent 9% and 6% of the total customers served by the domestic solar businesses.

Aggregating market segments and the proportion of engagement of local companies:

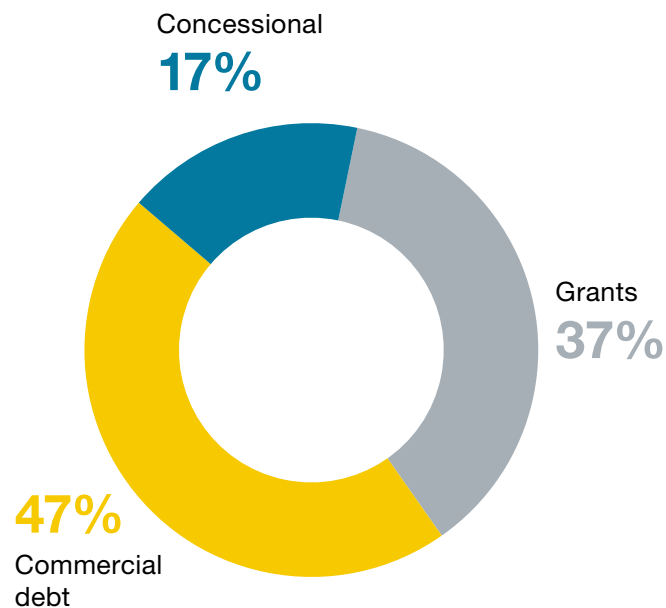
- Most of the businesses serve **pico, SHS** and **standalone institutional** solar market. There is an emerging market for **captive solar PV and mini-grids**.
- Domestic solar companies are also offering services such as installations for solar-powered irrigation, cooling, milling, and street-lighting.
- Other services offered are in energy audits and cold chain management consulting.
- **Domestic solar businesses operate across multiple solar PV market segments and offer diversified services, with a majority depending on sales and distribution of PV products.**

2.5 Business models

SEGMENT	CHARACTERISTICS	BUSINESS MODEL AND MEANS OF FINANCE FOR OFFTAKER
Pico solar products and Solar Home Systems (SHS)	<p>Pico solar are portable solar products for lighting and mobile phone charging. Solar home systems are used for multiple lighting, phone charging, radio and television.</p> <p>These products are either locally sourced or imported.</p> <p>Customers are mainly households in rural and urban areas. Capacity range: 1W to 400W.</p>	<ul style="list-style-type: none"> Pico solar products are mainly purchased on cash, while a combination of cash, PAYGO and debt from financial service providers is used to purchase solar home systems. The main channels used to sell products are via branches, agents and partnerships with local communities, SACCOS and NGOs. Commercial banks such as Centenary and Post bank have tailored solar products to finance consumers. SACCOS also offer consumer finance for solar products.
Standalone Institutional systems	<p>Customers are mainly schools, technical institutes, churches and mosques, health centres, small businesses, installations in refugee camps who use them for lighting, phone charging, entertainment, and productive use such as water pumping.</p> <p>Capacity range: 150W to 6 kWp.</p>	<ul style="list-style-type: none"> These are typically donor (e.g. USAID, GIZ) NGO, government or self financed projects. Local companies get selected through a competitive tender process. The scale and size of the systems and the target beneficiaries are pre-determined by the stakeholder groups. The systems are installed and sometimes maintained by the domestic solar companies, under operation and maintenance contracts. Solar systems are financed through cash, or loan support from bank, or via grants from donors.
Solar Mini-grids	<p>Mini-grids for household, business and productive use, typically located in rural areas.</p> <p>Most of them are hybrid solar PV/diesel/battery.</p> <p>Capacity range: 10kW and 600 kWp.</p>	<ul style="list-style-type: none"> Installations are sourced mainly through public tenders by the Rural Electrification Agency, or funders such as GIZ and USAID/Power Africa Domestic companies are part of joint ventures with international companies to support with licensing, EPC, O&M or sub- EPC. Operation & maintenance support from the communities in some instances. Consumers pay a tariff (cost-reflective or with a subsidy component), determined by the mini-grid developers and subject to the type of investments secured.
Commercial and Industrial captive PV	<p>Commercial and industrial consumers self-generating electricity mainly through rooftop systems. Serves both urban and rural customers.</p> <p>Capacity range: 10 kW to 1 MW.</p>	<ul style="list-style-type: none"> Financed by impact investors with less direct involvement of commercial banks. Domestic solar companies design, install and provide O&M services. Consumers buy mostly via outright purchase, perhaps with a capital support from banks in the form of loans. Rent-to-own and power purchase agreements models are also gaining more traction.

2.6 Funding raised by domestic companies

Amidst several challenges domestic solar companies have raised investments of about **\$4 Million** from 2012 to August 2021. The total amount raised is **4.5 times less** relative to the international solar companies.⁶



Local solar businesses have raised more debt than grants. This report only gathered data on direct grants received for market development by the businesses and not grants from contracts to install solar systems.

Based on the data provided by the domestic companies, **debt financing totalled to USD \$ 2.539 million while grant financing contributed USD \$ 1.461 million of the \$4 Million raised.**

The ticket sizes for investment raised range **from \$ 10,000 - \$ 200,000** for debt and **between \$ 30,000 - \$ 150,000** for grants for a tenure of 1 to 3 years. **More commercial/non concessional debt has been raised than concessional debt.** Concessional debt typically offered by DFIs and impact investors offer favourable terms such as lower interest rates, grace periods and alternative collateral such as receivables compared to market rates offered by most commercial lenders. Domestic companies use the loans to import solar products and improve operations.

With respect to grants, development partners offer **performance based or milestone based grants** for innovations, business growth in order to achieve the business and development impacts. From the interviewed companies, 4 received grants from GIZ, 3 from Sendea, USAID and UNCDF, 2 from University programmes and 1 from the Global Distributors Collective.

There were 8 out of 10 businesses that received grant financing, and 6 out of 10 that received debt financing. Of the 6 companies, 3 transactions entailed concessional debt.

Debt has been used for mainly purchase of stock while **grants are mainly used for innovations and COVID-19 relief** and to a very small extent purchase of stock. Some examples of grant spending are; product testing and certification, marketing, distribution, staff training, digitalisation of activities, stock, staff costs, and communication.

In terms of other sources of financing, no locally owned business has raised external equity because of the fear to loose control of their companies.

2.7 Sources of funding and process

- Commercial debt providers are **Centenary bank** and **premier credit**,
- Concessional debt has been provided mainly by **SunFunder**, **UNCDF** and **SIMA fund**.
- Development organisations such as **GIZ**, **Sendea**, **UNCDF**, **Global distributors collective** and **Universities** such as Maastricht and Harvard financed the businesses using grants



Interest rate and collateral requirements for debt and grants raised






Financial institutions normally request collateral security (mostly land title or agreement) of more than 100% of the loan value.

Local solar businesses are using their land as collateral with support from guarantees provided by organisations such as USAID, World bank in partnership with UECCC and UNCDF (supported by SIDA).



In spite of these requirements, commercial debt providers also charge interest rates of **17%-25%** while impact investors and development partners offer concessional rates between **15% to 17%** per annum.

Providers of grant finance usually ask for **business track record**, **sustainability of innovation or initiative**, **development impact** and **proof of co-financing** as requirements for grant finance.

2.7.1 List of debt providers and local companies supported

INSTITUTION	DESCRIPTION	COMPANIES SUPPORTED
	<p>The commercial bank offers a dedicated solar loan for consumer finance and working capital supported by Uganda Credit Capitalisation Company.</p>	<p>Solar Today, Power Trust, Victron solar</p>
	<p>Micro-finance institution which to provide financial solutions to corporates, government and individual entrepreneurs.⁷</p>	<p>All in Trade</p>
	<p>SIMA's Energy Access Relief Fund provide up to 3.5-year tenure, subordinated, unsecured, low-cost and subsidized loans to viable companies that are facing liquidity challenges due to COVID-19. It targets loan ticket sizes of less than \$1M, within a range of \$50K to \$2.5M.⁸</p>	<p>Xpreme Solar Solutions</p>
	<p>Sun Funder provides finance for solar energy in parts of the world where people and businesses lack reliable access to electricity.⁹</p>	<p>All in Trade</p>
<p>Village Sacco</p>	<p>Village savings and credit cooperative which provides loans to its members.</p>	<p>GRS</p>
	<p>UNCDF's LDC Investment Platform– through grants, reimbursable grants, loans, and guarantees – provides seed funding to investments in LDGS that are deemed too small or too risky by traditional investors.¹⁰</p>	<p>All in Trade, Solar Today</p>

2.7.2 List of grant providers and local companies supported

INSTITUTION	DESCRIPTION	COMPANIES SUPPORTED
	<p>Under its programmes Endeav, Green people's energy, GiZ has provided results based grants of amounts ranging from EURO 15,000 to EURO 100,000 for distribution of solar products.</p> <p>Some of the grants were provided as COVID-19 Economic relief to support companies maintain current levels of energy access and build resilience for future challenges.</p>	<p>Sunny Money, Anuel Energy, Kambasco, Power Trust</p>
	<p>GDC is a collective of last mile distributors around the world. We are dedicated to supporting distributors to help them reach millions of unserved customers with life-changing products, and to developing the last mile distribution sector as a whole. Through their innovation challenges, they provide grants of £ 50,000 to last mile distributions. 11</p>	<p>Kambasco technologies</p>
	<p>Membership organisation for local solar companies that provides funding, skills building and sourcing of partnerships. They have provided grants to 3 of the interviewed domestic solar companies to implement solar villages programme. Grants amounts range from \$50,000 to \$ 100,000.</p>	<p>Access to solar, Anuel Energy, Sunny Money,</p>
	<p>Through the Renewable Energy Challenge Fund supported by the Embassy of Sweden, UNCDF provides grants to solar companies to reach underserved populations with clean and affordable energy. Grant amounts provided range from \$50,000 to \$500,000.</p>	<p>Anuel Energy, GRS, Power Trust,</p>
	<p>USADF's investments promote local economic development by increasing incomes, revenues and jobs, and creating pathways to prosperity for marginalized populations and underserved communities. In the energy sector, they provide grants of upto \$100,000 through the off-grid energy challenges. 12</p>	<p>Solar Today, Power Trust and GRS</p>
<p>Universities</p>	<p>Harvard Business School and Maastricht university have provided seed capital for business start and innovations for financial inclusion.</p>	<p>Anuel Energy and GRS</p>

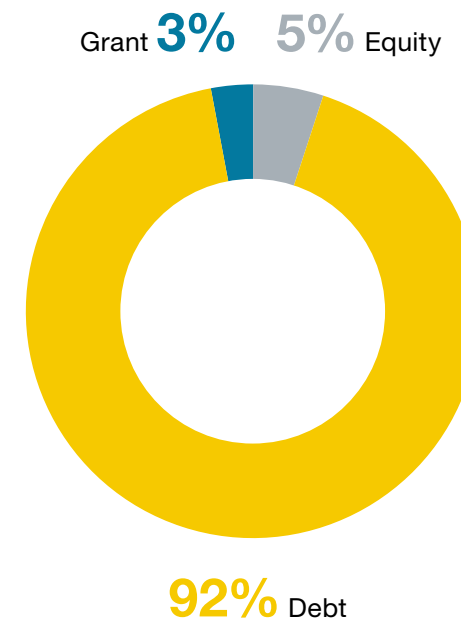
2.8 Additional demand for finance

- Locally owned solar companies are seeking more debt (92%) and less of equity (5%) and grants(3%). The high appetite for debt is an indication of limited opportunities for alternative sources of capital.
- Ticket sizes range between **\$50k to \$2.7 Million** to be used for purchase of solar products, accessories and appliances, marketing (customer acquisition, expanding distribution) and staffing for business expansion.
- **The large institutional solar market segment accounts for the highest demand for capital at 71%**, followed by pico and standalone solar systems at 14% with captive solar and minigrids accounting for the lowest demand at 9% and 6% respectively.
- The quality of the investment pipeline has not been assessed, therefore the investible pipeline could be less than stated in the report.

There is a high demand for debt from the growing markets of large institutional and pico/solar home systems.

Disclaimer: The amount and portion of investment needed is indicative and bound to change.

INVESTMENT PIPELINE BY FINANCING INSTRUMENT



2.9 Growth trajectories (1)

Over the last 19 years, domestic businesses have evolved and grown to cope with the changing market and technology, to serve better the needs of the customers, and scale their business. Some started from a home based office, and grew incrementally, later moving on to rented premises and muddling through the initial growth years. Several companies increased their staff capacities, grew their sales staff, hired qualified and certified technicians over time, and a few also hired financial and business development specialists. The domestic businesses made changes in product sourcing and service offering, along with financing and distribution models. This is owing to experiences gained over time, the need to adapt to a changing business environment and the need to remain competitive in new market realities.

Below are three key ways in which the solar businesses have grown over time:

GROWTH TRAJECTORIES	DESCRIPTION	EXAMPLES
Moving into new and improved functions within solar PV market	<ul style="list-style-type: none"> • Modifications to the business models • Focus on last mile • Leveraging digital tools and remote monitoring 	<ul style="list-style-type: none"> • From single branch to multiple branches, and micro-franchises • From local sourcing to importation • Offering new consumer financing options (Paygo, leasing)
Moving into newer, larger-scale market segments	<ul style="list-style-type: none"> • smaller-scale systems to relatively larger-scale, and customized • performing higher technical functions 	<ul style="list-style-type: none"> • SHS to institutional and productive use • Institutional solar to captive solar and mini-grids
Moving into allied sectors and non-solar markets	<ul style="list-style-type: none"> • Offering complementary products and services to similar and new customers 	<ul style="list-style-type: none"> • Pico/SHS to cook stoves and briquettes • Institutional solar to electric vehicle charging stations • Sale of energy-efficient appliances

2.9 Growth trajectories (2)

Additional examples for the growth trajectories pursued by the domestic businesses:

- Modification of business models:** For instance, E- power solutions and Power trust started importation of solar products instead of local sourcing. Power Trust, GRS started by developing biomass minigrids but later changed to Solar PV minigrids. Solar Today used to provide inhouse consumer finance, but complemented it with financing from financial institutions to reduce the liquidity burden and Anuel Energy closed all its branches because of the high operating costs and now distributes solar products through community based agents.
- Focus on last mile distribution:** In order to reach last mile customers, different distribution strategies have been deployed, especially for those in pico solar and SHS market segments. For instance, Solar Today, Victron solar and Power trust have set up 12 branches across the country, and Access to solar, Anuel Energy and Xpreme solar (trading as Sunny Money) and Kambasco technologies employed youths, school administrators, teachers and village saving groups (SACCOs) as sales agents . The four companies employ over 65 sales agents.
- Transitioning into newer markets, larger-scale systems:** Domestic solar companies are diversifying their product ranges and services to provide higher value products with better margins and more impact. Victron Solar used to only install solar home and institutional solar systems but has now advanced to install captive solar PV for commercial and industrial use while All in Trade now provides EPC services to Minigrids project developers and plans to build, operate and maintain its own minigrids.
- Offering complementary allied products and services:** In addition to providing solar products to different market segments, domestic companies provide solar systems combined with related products to create business opportunities, improve productivity and improve security. Domestic companies such as Anuel Energy are providing barber salon kits and water pumping technology. Power Trust provides solar powered mills while GRS has pivoted from constructing minigrids to provision of cold chain services and Kambasco plan to construct electric vehicle charging.
- Use of digital tools:** Domestic companies have embraced use of digital solutions to provide consumer finance, reduce operational redundancies and costs. Examples include the use of Enterprise Resource Planning (ERP) software to manage and integrate all key aspects of business, integrate PAYGO and/or remote monitoring to offer payment plans and develop credit assessment software to improve the quality of the credit portfolio.

2.9.1 Examples of companies growth trajectories – Solar Today

Since its inception in 2010, Solar Today expanded its distribution network to **6 branches, partnerships with 20 Savings and Credit cooperatives** and **2 commercial banks** leading to **sales of 14,500 solar systems** in Western Uganda. The company designs, supplies, and distributes modular solar products ranging from 30 Wp to 5 kW to households, businesses and institutions mainly for irrigation and solar water pumping purposes. Solar Today also supplies and installs power back-up systems, streetlights and solar water heaters for both households and institutions.

The Company's solar systems are sold on both cash and credit. Credit is offered inhouse using Solar Today's payment plan or partnerships with financial institutions such as Centenary Bank, Equity Bank and Finance Trust Bank and Savings and Credit Cooperatives such as Ebo and Butuuro People's Saving and Credit Cooperative (SACCO). From 2013, Solar Today has grown their solar loan portfolio to around UGX 500 Million and has a yearly revenue of around UGX 1 billion.

Solar Today's robust recruitment system, internship programme and training and mentorship with support from organisations such as CREEC and Managers Without Borders has enabled them to build and retain a committed and experienced team to support the company's growth. Staff have also received financial support from the company to upgrade their technical and management skills through further studies in MBA, CPA and diplomas in electronics and electrical engineering. Before the outbreak of the COVID- 19 pandemic, the **company employed 35 staff who had been with the company for at least 3 years**, but during 2021 the number of staff has reduced to 29 to cope with the low revenues during the lock down.

After being established in Western Uganda, the **company opened offices in Kampala and Arua to tap into opportunities for larger solar projects** from Government, NGOs and development organisations. Solar Today has successfully implemented solar projects for the Ministry of Local Government, UNHCR, Hunger Project Uganda, ACTED Uganda, Compassion International and Finn Church Aid among others.

Because of its focus on providing quality, continuous improvement in processes to serve customers better and growth in sales turnover, Solar Today has consistently appeared among the Top 100 mid-sized companies in Uganda for the last four years for its business excellence and entrepreneurship success by KPMG and National Media Group.

SolarToday's growth trajectory depicts an impeccable trend which the company continues to espouse especially with the Global trend directing to increased promotion of renewable energy.

2.9.2 Examples of companies growth trajectories - GRS

The idea to start GRS rose from the founder's university research finding which revealed how acute energy shortages was affecting the floriculture industry in Uganda. With SEED funding from the university, GRS started in 2009 with the goal of generating electricity through conversion of waste from flower farms into electricity. Between 2011 and 2015, the company **constructed 2 energy to waste plants with a total installed capacity of 47 kW** from agricultural waste and water hyacinth as the primary source of feedstock. The gasification plants faced a lot of operation challenges emanating from the poor quality and limited adaptability of the technology and the low and intermittent supply of the feedstock.

As they spend time on figuring out how to make the gasification technology work, the founder decided to explore other technology options such as solar. In 2016, the founder through his networks at UC Berkeley, signed an agreement with start up company in California to set up a 10 KW pilot solar mini- grid on Kitobo Island in Uganda and managed to provide access to solar electricity to 35 businesses. In 2017 the Kitobo Island concession was awarded by Electrification Regulatory Agency (ERA) to an Italian company- Absolute Energy, who contracted GRS as a local EPC partner to support procurement and importation of solar products and accessories, in country logistics, assembling local teams, and mobilising of the local communities. This joint venture led to the construction of a 438KW solar minigrid connecting 600 households including small businesses with electricity. The collaboration of GRS and Absolute Energy was further extended with support from USADF to construction of another off-grid solar minigrid on Bukasa island of 100KW which they supported in liaising with REA for license application and acquiring necessary operational permits, land acquisition, community mobilisation and customer sign up and managing contractors.

As the founder worked on construction of minigrids he identified an opportunity to increase demand for electricity for the minigrid through provision of cold chain services. Currently GRS operates two ice flake ice plants to provide cooling services to the fishing industry which has reduced post harvest losses by 35%.

Since its inception in 2009, GRS has **employed 25 full time and temporary employees**, seen its **annual turnover grow by 50% from 2018 to 2020** and has provided clean and affordable electricity access to more than 635 households including businesses. Currently GRS has diversified into the captive PV for commercial and industrial in partnership with enPower.life which provides financing and Equator solar which provide the EPC services in Uganda.



03

Constraints for continued business growth and solutions

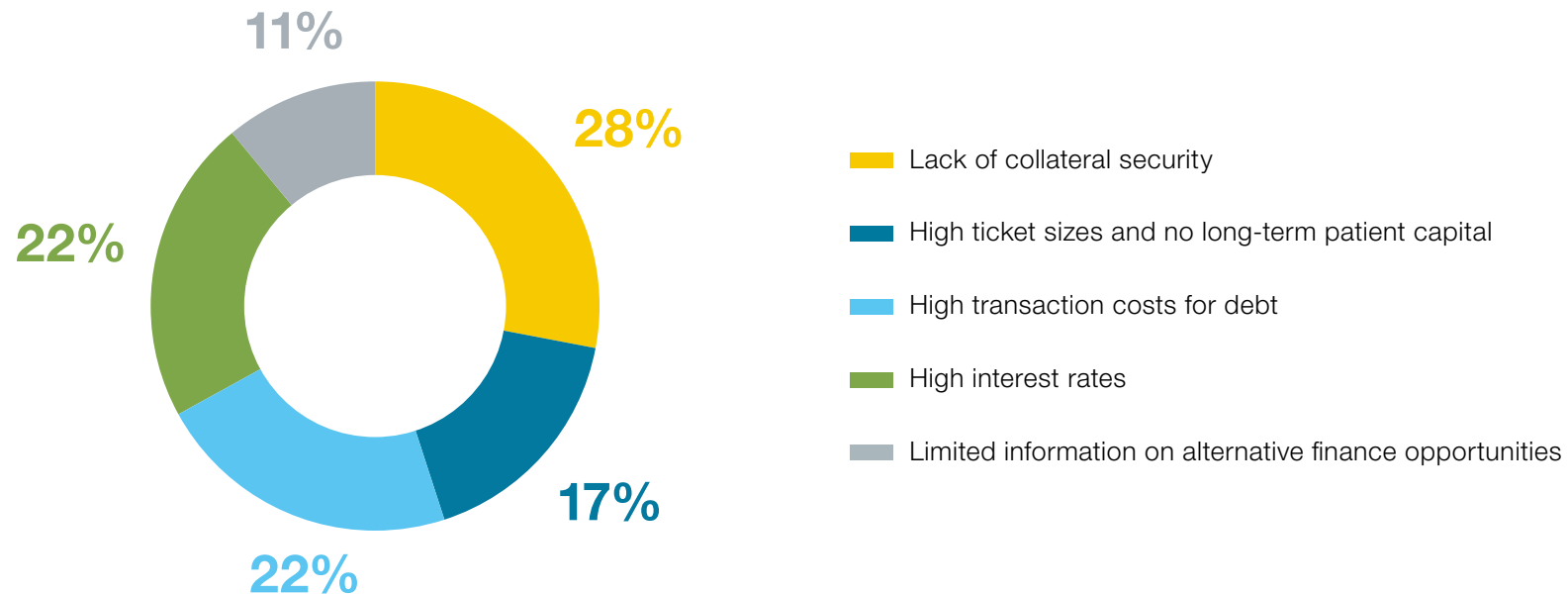
Summary of key constraints | Deep dive into access to finance and managerial and financial skill-gaps

3.1 Summary of key constraints

BARRIERS	DESCRIPTION
Lack of affordable and appropriate finance	Even though domestic solar companies have had some success in raising capital, the amounts raised are still low compared to the demand for capital. This low capital raise is attributed to the limited experience in communicating with investors, writing business plans/proposals and lack of financial skills especially in financial modelling. Furthermore, the high cost of borrowing, limited long-term funding opportunities and insufficient information on how to raise capital through alternative mechanisms such as crowd funding have accelerated the challenge of lack of finance.
Managerial and technical Skills gaps	Business owners and managers lack the skills and experience in managing and growing their businesses , proposal writing and communication with investors. Due to the fast technology developments, there is a gap in knowledge of design, installation, maintenance and operation of large scale and hybrid solar systems. Solar companies also lack the financial resources to pay for the training courses due to competing priorities such as salary payments and stocking products to meet needs of their customers.
Outbreak of COVID-19 pandemic	The coping measures for COVID-19 such as curfew and business lock down have immensely affected operations of the solar companies. For PAYGO companies, the portfolio of non-performing loans has increased and delivery of stock has been delayed for up to 6 months. Some companies have also resorted to laying off staff to cope with the low business.
Unclear policies and regulations	Despite efforts by industry associations, the application of tax exemptions for solar is not uniform. For emerging market seg-ments like captive solar, the procedures for registration and licensing are not clear and there is still a proliferation of low quality solar products on the market.

In the following section, we dig deeper into the first two of these constraints presented above.

3.2 Details of constraints to access to finance



Over 90% of the domestic solar companies indicated that access to finance is a key barrier for further business growth. The **lack of collateral security, high cost of borrowing, caused by high arrangement and transaction costs and high interest rates, high ticket sizes and lack of long term patient capital and limited information on alternative financing mechanisms** such as crowd funding are the key demand side barriers to access to finance. The processing fees are as high as 5% and interest rates range from 15% to 27%.

From the funders and investors viewpoint, the **lack of qualified financial staff and systems, lack of fundraising experience,** and the **high customer default rates of credit or PAYGo** are among the reasons they don't provide capital to domestic solar companies. Locally owned solar companies also lack the understanding of the requirements to qualify for higher ticket size funding and the commitment to make improvements which will position them to attract such investments in future.

3.3 Details of constraint of managerial and technical skills gap

- Most of the business owners and managers do not have prior management experience in running business, and only 20% have previous experience in finance and accounting. Locally owned solar companies learn on the job with no or limited mentorship and training opportunities, which sometimes limits their ability to make strategic decisions about the growth of the business.
- With the advancement in solar PV technology, domestic solar companies need to re-train and build advanced technical skills for design, installation and operation and maintenance of solar PV systems. The growing interest in productive use such as irrigation and water pumps also required multi-skilled technicians in not only solar PV systems but also water systems. The key managerial skills lacking are for concept note or proposal writing, communication with investors, financial planning, reporting and interpretation of financial statements.
- Locally owned solar companies also lack the financial resources to pay and utilize the knowledge and skills from the training courses due to competing priorities of salary payments and having sufficient stock to meet customer needs. They are further discouraged by the staff leaving after they have invested heavily in building their skills.

KEY MANAGEMENT SKILLS GAPS

- **Management skills:** Business planning, concept note and proposal writing and communication with investors
- **Financial skills:** Interpretation of financial statements, cashflow forecasting and selection of qualified audit firms.

KEY TECHNICAL SKILLS GAPS

- There is a lack of technical **skills for design, installation, operation and maintenance of large and hybrid/grid tied solar solutions.**
- Technical staff also require soft skills for customer service and credit management given the integration of roles within solar companies.



04

Conclusions and recommendations

Concluding the report findings | Recommendations to address key challenges
Additional recommendations for stakeholder groups

4.1 Conclusions

Domestic solar companies play a significant role in promoting energy access and stimulating local economic development. Despite this, they have received limited attention and have less opportunities to access the much needed investments to scale up their solar businesses. **This report presented insights into the characteristics of Ugandan solar companies how they have grown and sustained their businesses, the funds and investments raised, and the challenges they face.**

This report covers 10 domestic solar companies that have been operating for more than five years in Uganda. Over time, the businesses have formalised and restructured, they have had the opportunities to test different business strategies, they have developed partnerships, and continuously sourced investments to support the growth. Some businesses started off very small from their home office, others reinvented themselves by shifting from focusing on solar home systems to minigrids and to captive C&I PV. While some businesses now provide end-user finance through partnerships with commercial banks and Saccos, others have restructured and explored different distribution channels to focus on last mile distribution as a way of sustaining their businesses.

Even though domestic solar companies have sustained and grown, they continue to face challenges in relation to **the policy and regulatory environment, access to finance, lack of managerial and technical skills and the impact of COVID-19 on the businesses and their customers.** These challenges not only affects the businesses and its customers, it has far reaching effects also on economic development of unelectrified areas and the country's progress in achieving its social and development goals. The report examines these challenges in the context of domestic solar companies and even attempts to make recommendations on how to strengthen these businesses for increased and sustained impact.

The recommendations to some of these abovementioned challenges are presented in the following.

4.2 Recommendations to addressing key challenges

BARRIERS	PROPOSED ACTIONS
<p>Limited access to finance.</p> <p>Proposed action under limited access to finance: Sensitize investors on the opportunities in the sector and the businesses on finance opportunities and investment criteria</p>	<ul style="list-style-type: none"> • Provide aggregate feedback to companies on how to improve quality of funding proposals • Build a pipeline of businesses and projects by sharing information on investment opportunities, offering transaction advisory services and financial literacy • Training to solar businesses. • Develop tailored finance with smaller ticket sizes and longer tenures • Establish a renewable energy trust fund to cater for different financing needs in the sector. • Advise solar companies to build a credible payment track record through timely payments and communication in case of default. • Research on how to improve uptake of existing investment de-risking instruments and scale alternative financing mechanisms such as crowd funding.
<p>Outbreak of COVID-19 pandemic</p>	<ul style="list-style-type: none"> • Lobby to include solar sector as essential sector to support preventive measures for COVID-19. • Provide COVID- 19 relief funds • Train and coach solar companies on business resilience and survival.
<p>Unclear policies and regulations</p>	<ul style="list-style-type: none"> • Establish policy dialogues on key sectoral issues between policy makers and private sector. • Build capacity for policy makers on the policy gaps and priorities • Ensure consistent and streamlined application and interpretation of regulations (e.g. solar VAT) • Establish policy benchmarking with other countries especially on deployment of captive PV and Minigrids
<p>Managerial and technical skills gaps</p>	<ul style="list-style-type: none"> • Continuously improve the curriculum to incorporate higher technical needs such as for sizing, designing systems • Integrate of renewables in national curriculum • Establish shared spaces with shared tools for technical training and support such as Uganda Industrial Research Institute. • Encourage managers to undergo management training, financial trainings, perhaps supported by UNREEEA

4.3 Recommendations to stakeholder groups (1)

Based on the interactions with stakeholders during the interviews, co-creation workshop and high level solar investment workshop, we put forward a non-exhaustive list of recommendations to industry associations, domestic companies, financial institutions, investors, education, training and research institutions and government and development partners on how to strengthen the role of domestic companies in delivering electricity access and related services in Uganda.

INDUSTRY ASSOCIATIONS

Industry associations such as UNREEA, USEA should take a lead in developing a common vision for support of domestic businesses by highlighting the relevance and needs of domestic solar companies and formulate solutions to address the challenges they face. Associations should collect sector and company level information, inform and lobby for better policies, support skills building, and support businesses in attracting investments. The existing platforms such as NREP should address the creation of an investible pipeline of solar projects, share investment opportunities and other relevant information and prepare businesses for investment readiness. This platform could also be used as an avenue for investors sharing aggregated findings on why the businesses are not funded based on their call for proposals or investment activities.

LOCAL BANKS AND INVESTORS

Domestic solar companies face numerous challenges with access to finance such as high costs of borrowing, and high collateral requirement. The lack of proper organizational structure, under-documented financial records, and limited experience in fundraising accelerates the challenges with capital raising. On the other hand, financial institutions especially local banks are also limited by low motivation to sell solar loan products, and are constrained by their lack of expertise in assessing and monitoring solar businesses and investments. Organisations such as USAID/Power Africa, UECCC, UNCDF, European Union are extending support through providing de-risking instruments, concessionary finance and capacity building for both businesses and financiers. This investment support should be more inclusive and equitable within the solar PV industry. Financiers need to develop green finance strategies better tailored and suited to local businesses (e.g. small ticket sizes, long tenor etc.). Financiers could provide aggregate support and tools to local businesses in organizational structure and management systems.

4.4 Recommendations to stakeholder groups (2)

UNIVERSITIES, TECHNICAL AND VOCATIONAL TRAINING INSTITUTES AND RESEARCH ORGANISATIONS

Efforts to build competencies in the solar sector have so far focused on technical skills, but are somewhat lacking on entrepreneurship and management skills. Furthermore, there is lack of harmonized and accredited training courses and experienced training facilitators. Existing technical trainings only cater for entry level trainings needs instead of intermediate and expert trainings for more complex, larger-scaled and hybrid systems.

Education- and training institutions as well as researchers are urged to carry out comprehensive sector needs assessments to develop tailored entrepreneurship and management trainings for business owners and managers. This should be in addition to advanced technical trainings for design, installation and maintenance of advanced and complex solar systems such as captive solar and hybrid systems. Technical trainings should be accredited by the Directorate of Industrial Trainings. Training institutes should also develop shared learning spaces with shared tools for technical training to avoid the high costs of training tools and to reach more training participants.

GOVERNMENT AND DEVELOPMENT PARTNERS

Government should mainstream the Buy Uganda Build Uganda (BUBU) policy and local content requirements by developing sectoral guidelines and requirements for how ministries, agencies, financiers and development partners can include local content into their programmes and procurement policies. It is also recommended that both Ministry of Energy and Mineral Development (MEMD), and Ministry of Trade, Industry and Cooperatives (MTIC) collaborate to develop integrated strategies, plans and programmes on how to strengthen the support to domestic solar companies.

Development partners should develop initiatives specifically tailored to addressing the needs of the domestic solar companies. Initiatives such as trainings, de-risking instruments such as loan guarantees and concessionary finance that already exist can be tailored based on the understanding of these businesses. Further, they could rely on and use of implementing partners who have in-country structures and expertise to support domestic businesses. Development partners should study why de-risking financing instruments are under utilised and how these initiatives can be expanded to impact more domestic businesses.



05

Appendix

Appendix A: List of interviewed stakeholders

ORGANISATION	REPRESENTATIVE SHAREHOLDER
Access to Solar technologies	Founder and CEO
All in Trade	Co-founder and Managing Director
Anuel Energy	Co-founder and CEO
E – Power Solutions	Co-founder and
GRS	Director and Team Leader
Kambasco technologies	Managing Director
Power Trust	Managing Director
Solar Today	Co-founder and Operations Manager
Xpreme Solutions	Managing Director
Victron Solar	Managing Director
Ministry of Energy and Mineral Development	Ag, Commissioner Renewable Energy
Uganda Development Bank	Climate Finance specialist
Abi Trust	Meeting held with 3 representatives: Head of Business Development, Head of Fund Management and In charge of the partnerships with the FIs
Post bank	Head of strategy and Planning, Executive Assistant, manager Research and product development
Sendea	Chief Executive Officer
Open Capital Advisors	Project Leader

Appendix B: List of company profiles



01 — COMPANY OVERVIEW

Access to Solar technologies started in 2015 as a Community Based Organisation with the mission of empowering vulnerable communities with affordable solar lighting solution. In 2017, it was registered as a limited liability company.

The Jinja based solar company distributes and installs solar lighting, phone charging, business, and water pumping solutions to last mile customers without access to electricity.

Year of registration: 2015

Location: Jinja

Agents and locations: 1 branch in Jinja and 5 Village solar energy teams

Products

Pico solar lanterns, Solar Minikits, Security Lighting systems, water pumps for Irrigation and Customised household, institutional and business solar systems.

02 — DIRECTORS EDUCATION AND EXPERIENCE

The management team at Access to Solar Technologies has a variety of experience spanning project management in a not-for profit organisation and operation, sales and installation of solar systems and energy efficient appliances.

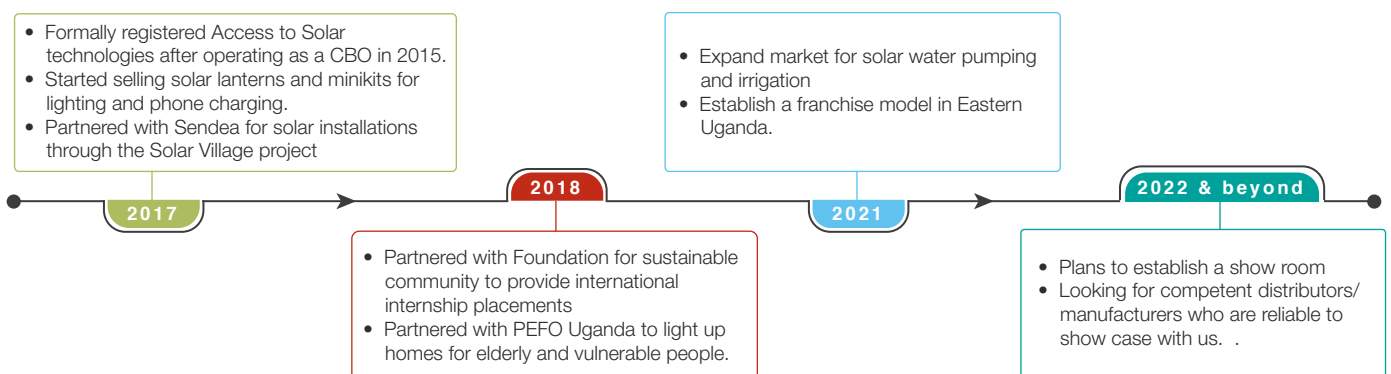
Education background:

The Founder and CEO has a Bachelor's degree in Information Technology and certifications in CCNA and CISCO also has an Advanced Diploma in Logistics and transport management (MCILT).

Previous Working Experience:

Worked as a project manager for a charity organisation, run his own business and worked for a solar distribution company for 3 years.

03 — BUSINESS GROWTH JOURNEY



04 — INVESTMENT NEED

Company is seeking USD \$ 50,000 in equity and grants.

Use of funds:

To purchase stock for standardized solar systems, security lights and water pumps.

PARTNERS

- Sendea Uganda
- Solar Energy Foundation
- Foundation for Sustainable Community Development
- Phoebe Education Fund for Orphans & Vulnerable Children (PEFO)
- Don Bosco St. Joseph Vocational school Kamuli (Dept. of Electronic Engineering)

06 — IMPACT

- ✓ Sold more than 550 solar products benefiting over 45,000 people
- ✓ Employs 08 full time staff and 5 sales agents.
- ✓ Reduction in CO2 emissions from use of kerosene candles and lamps

01 — COMPANY OVERVIEW

All in Trade Limited is an ISO 9001:2015 certified private Uganda company incorporated in November 2008.

The company deals in design, supply, installation and maintenance of reliable and affordable solar energy systems, power backup systems, electrical services, wind energy systems, power protection systems and other renewable energy solutions to the population of Uganda and the neighboring East African countries.

Year of registration: 2008

Location: Kampala

Head office: Walusimbi's Garage Building, Plot 13/15, Dewinton Rise, Kampala

Products

Solar home systems, Captive solar, Minigrids, Solar Water Heaters, Power Backup systems, Wind energy solutions and electrical services.

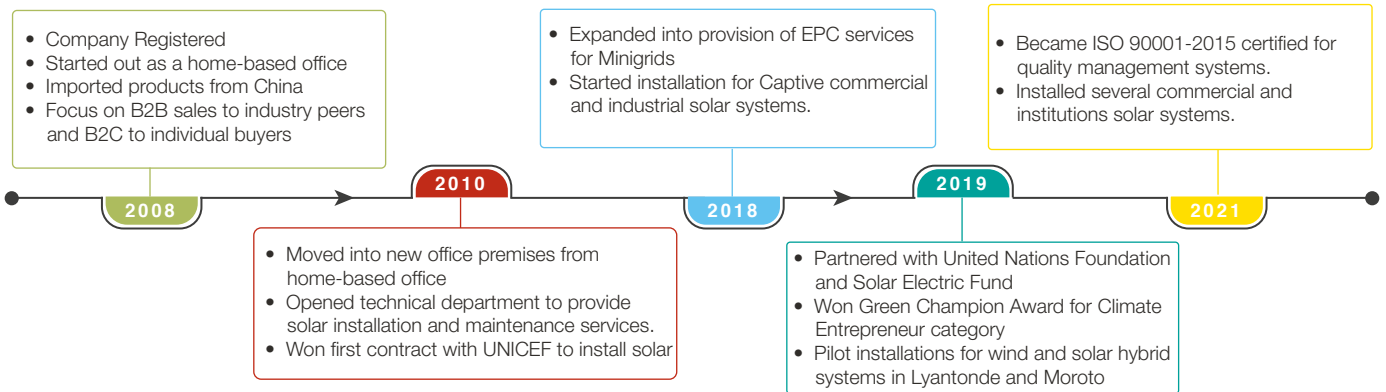
02 — DIRECTORS EDUCATION AND EXPERIENCE

The Directors have a combined experience of more than 35 years' experience in running a renewable energy enterprise. They have won several awards such as the Renewable Energy World's Solar 40 Under Forty Award, MEA Markets' award for Best installer for Solar Energy Systems in East Africa and the Green Climate Fund's Green Champion for the climate Entrepreneur Category Award.

Education background:

One of the directors studied Master of Arts Degree in Public Administration & Management and a Bachelor of Arts Degree in Social Sciences, another a bachelor's degree in commerce and a Diploma in Electrical Engineering and the third has a degree in commerce and finance. They also have professional certifications in Solar PV systems installation and integration, wind and solar energy systems and in accounting.

03 — BUSINESS GROWTH JOURNEY



04 — INVESTMENT NEED

Seeking debt finance of USD 500,000

Use of funds:

Increase solar and appliance stock levels, hiring more staff and other capital expenditures.

PARTNERS

- Electricity Regulatory Authority
- UNCDF
- USEA
- UNREEA
- Wind Power Association of Uganda
- Private Sector Foundation of Uganda

06 — IMPACT

- ✔ Sold and Installed over 691 solar systems benefiting 5.7 million people.
- ✔ Employed 26 full time staff
- ✔ Saved 27,917 tonnes of Co2

01 — COMPANY OVERVIEW

Anuel Energy sources, sells and distributes solar lanterns, plug and play kits and customized solar systems for household, commercial and institutional customers through its branch network, agents and partnerships. It seeks to be among the leading solar energy providers in Uganda and to impact 250,000 people by 2025.

In 2018, Anuel Energy incorporated was registered in the US and FINE solutions to focus on building financial inclusion.

Year of registration: 2015

Location: Kampala

Agents and locations: 30 across the country

Products

- Solar lanterns and solar home systems
- Institutional solar systems
- Solar powered sewing machines, fridge, water pump, salon kit

02 — DIRECTORS EDUCATION AND EXPERIENCE

The Directors who are active in supporting Anuel Energy have over 10 years' experience in business strategy, fundraising, and operating a solar business.

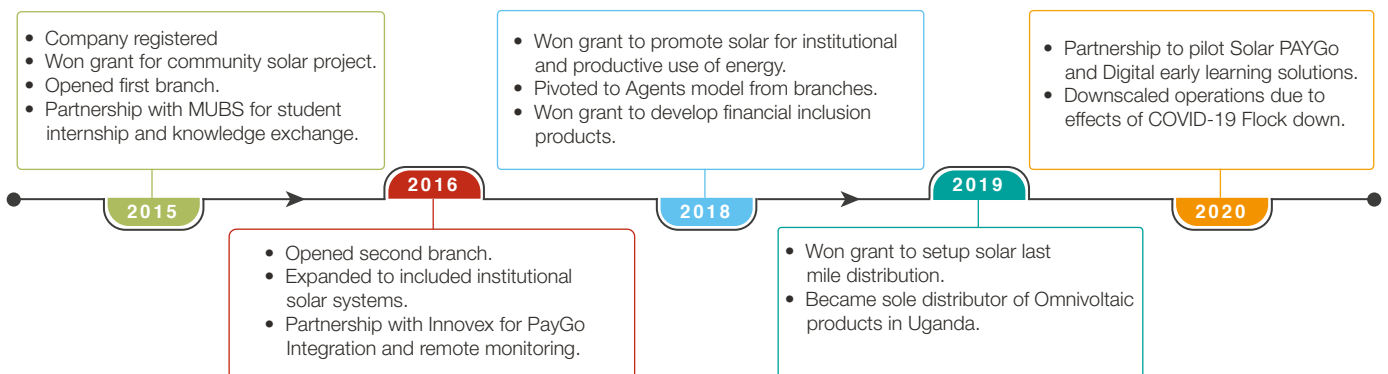
Education background:

The directors have degrees in Industrial Fine Art, Community Psychology, MBA and master's in public administration.

Previous Working Experience:

Worked in areas of research, cookstove design, solar business development, sales and marketing, training in the renewable energy sector.

03 — BUSINESS GROWTH JOURNEY



04 — INVESTMENT NEED

Seeking USD \$ 175,000 in equity and grants.
Looking for debts for end user finance

Use of funds:

- Purchase of Inventory
- Customer acquisition for commercial and institutional solar.

PARTNERS

- Sendea
- GIZ/BMZ
- UNCDF
- Harvard University
- Omnivoltaic
- USEA

06 — IMPACT

- ✓ Sold over 70,000 solar systems impacting over 75,000 people.
- ✓ Employes over 44 full time staff and agents.
- ✓ Replaced over 93,000 kerosene lamps which reduces on indoor air pollution.
- ✓ Reduced Carbon (Co2) emissions of over 2,550 tonnes.

01 — COMPANY OVERVIEW

E-Power Solutions Ltd was started 10 years ago by Ugandan electrical engineering graduates to provide electrical installation services. The company supplies, designs, installs, and provides post sales services for solar PV systems, water pumping solutions, air conditioners and power back up solutions.

Its clients are mainly local government, Not-for profit institutions, commercial entities, and individuals. E-Power Solutions also offers consultancy services in site assessments, electrical systems design and installations and project management.

Year of registration: 2004

Location: Kampala

Branch locations: 1 in Kampala

Products

- Solar home systems
- Institutional, commercial, and industrial solar systems
- Water pumping solutions
- General electricals

02 — DIRECTORS EDUCATION AND EXPERIENCE

The management team has a combined experience of 25 years working in design and installation of solar, air-conditioning and water pumping solutions, electrical engineering, operations, people management as well as project planning and management.

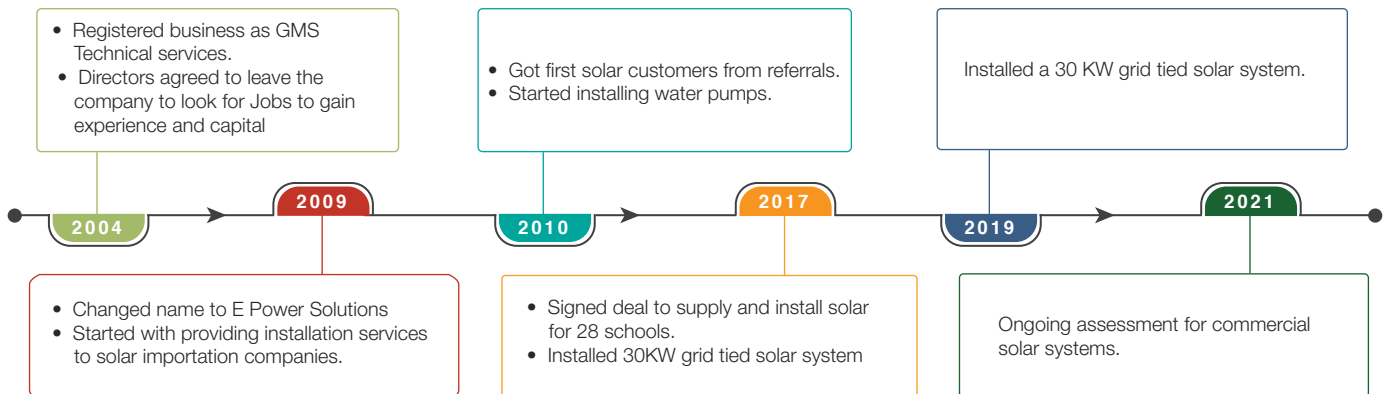
Education background:

The directors have degrees in Electrical Engineering, Environmental studies, Mass communication and project planning and management.

Previous Working Experience:

The directors worked for international electronics companies and local solar companies in design, installations, and maintenance of solar, air conditioning and power back-up solutions. They also worked in roles of sales supervisory and project management.

03 — BUSINESS GROWTH JOURNEY



04 — INVESTMENT NEED

Grant and debt of USD \$ 150,000

Use of funds:

- Purchase of stock
- Marketing.

PARTNERS

- Government Ministries
- Local Government
- NGO's
- USEA

05

06 — IMPACT

- ✔ Sold over 1,500 solar products, water pumps and street lights.
- ✔ Employs 16 staff
- ✔ Reduced co2 emissions.

01 — COMPANY OVERVIEW

GRS is a Ugandan business which focuses on building decentralised energy systems such as mini-grids, captive solar PV for commercial and industrial and deployment of productive use equipment such as flake ice machines.

The company also offers consultancy services for electricity demand stimulation through cold chain management.

Year of registration: 2009

Location: Kampala, Muyenga

Minigrid sites:

Bugala, Kitobo and Bukasa islands

Products

- Solar Minigrids
- Captive Solar- Commercial and Industrial

02 — DIRECTORS EDUCATION AND EXPERIENCE

The management team has a combined experience of 12 years working in development of off-grid renewable energy projects and installation of captive solar systems.

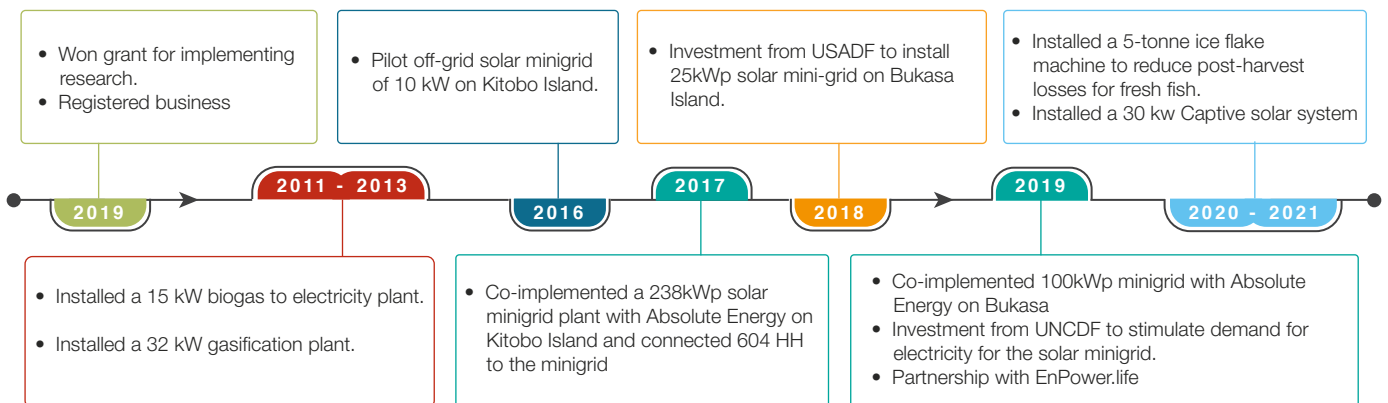
Education background:

The management team has expertise in project development, process engineering, feasibility appraisal and value chain analysis of small and medium scale renewable energy plants. In addition, they also possess expertise in financial management, Human resource and internal and external audit compliance.

Previous Working Experience:

Owned business in the tourism sector and worked in management, financial management and operations in the horticulture industry.

03 — BUSINESS GROWTH JOURNEY



04 — INVESTMENT NEED

Debt financing of USD \$ 300,000

Use of funds:

- Scaling production of ice production through purchase of flake ice machines.
- Staffing

PARTNERS

- Absolute Energy
- enPower.life
- Kalangala District Local Government
- Rural Electrification Agency
- USADF
- UNCDF

06 — IMPACT

- ✔ Connected 1,019 households, businesses, and institutions with electricity.
- ✔ Reduced 35% of post-harvest losses of fresh fish.
- ✔ Over 8 tons of CO2 is being avoided with the solar mini grid.

05



KAMBASCO TECHNOLOGIES

01 — COMPANY OVERVIEW

KAMBASCO Technologies Ltd is a Ugandan owned renewable energy and technology social enterprise that provides solar products for households and for productive use for water pumping, cooling and electric bike charging.

The company works with village savings and loan associations to develop business hubs and provide affordable consumer finance for the purchase of the solar products and services. Kambasco also offer energy project development services and trains youth, refugees, and technicians in PV installations, especially focusing on solar home systems and solar power for productive use.

Year of registration: 2015

Location: Kampala

Branches and locations: 1 in Kampala with linkages to upcountry markets via VSLAs (Village Savings and Loans Associations)

Products:

- Pico solar systems
- Standalone institutional solar PV systems
- Micro-grids.

02 — DIRECTORS EDUCATION AND EXPERIENCE

The management team at Kambasco Technologies has a combined experience of over 11 years with the bulk of that being in the renewable energy sector.

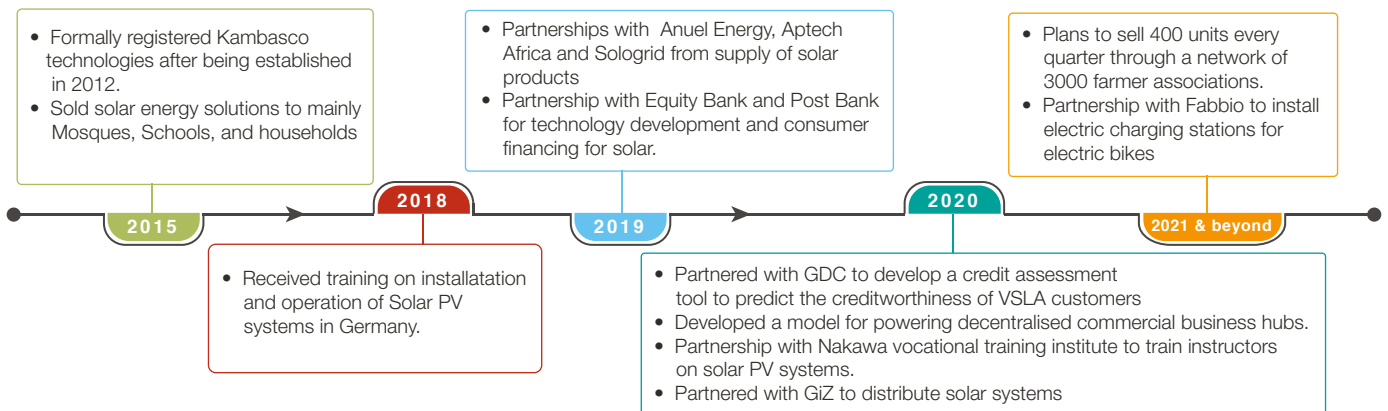
Education background:

The team is multi skilled and possesses an array of skills in Accounting and Environmental studies at Masters level as well as law (studies ongoing), Diploma in Business Administration, and ACCA competencies. Furthermore, members of the team completed solar technical training in Germany.

Previous Working Experience:

Work as senior financial systems officer with several development organisations and started and managed solar business in Tanzania.

03 — BUSINESS GROWTH JOURNEY



04 — FINANCIAL SNAPSHOT

Funding need: Company is seeking USD \$ 2.700.000

Use of funds: To purchase solar products to develop the solar business hubs and micro-grids.

PARTNERS

- Global Distributors Collective
- Nakawa Vocational Training Institute
- Fabbio
- Aptech Africa
- Winch Energy
- BBW
- GIZ/PSFU
- Anuel Energy
- Equity Bank
- CHARM. UK

06 — KEY ACHIEVEMENTS/ IMPACT

- ✔ Sold more than 1,500 solar systems benefiting 7,500 people
- ✔ Employs 06 full time staff.
- ✔ Successfully piloted the credit assessment tool with 6 VSLA's and scaling to 50 VSLAs.
- ✔ Trained 106 entrepreneurs and 16 technicians in entrepreneurship and Solar PV

05

01 — COMPANY OVERVIEW

Power Trust is a privately owned company, established to serve the needs of the growing energy sector by supplying appropriate environmentally friendly products and services. We have a vision to become the leading providers of clean energy solutions in Eastern & Central Africa.

Power Trust is a Clean Energy Products and services provider, dealing in sourcing, supplying, and installing solar systems, solar water heaters, power back up systems and generators as well as wind power solutions.

Year of registration: 2011

Location: Kampala

Branch locations: 2 in Kampala and 1 in Bweyale

Products

- Solar lanterns and solar home systems
- Commercial and institutional solar systems
- Solar street lights, fridges and water heaters

02 — DIRECTORS EDUCATION AND EXPERIENCE

The management team at Power Trust is experienced and has built capacity in the sector spanning 15 years. The team is proficient in strategic management, sales, marketing, engineering and operations.

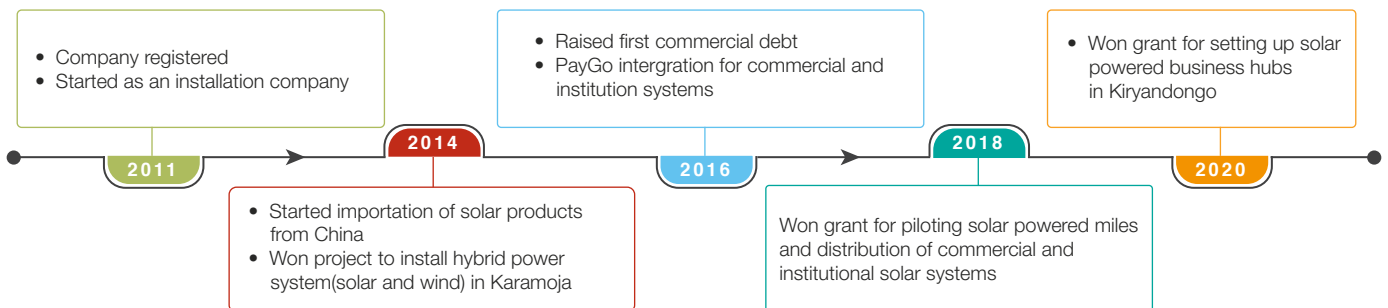
Education background:

They have qualifications in Electrical Engineering, Master of Business Administration and Accounting (ACCA).

Previous Working Experience:

Worked in sales, electrical design, engineering, and management in a solar distribution company.

03 — BUSINESS GROWTH JOURNEY



04 — INVESTMENT NEED

Grant and debt USD \$ 560,000

Use of funds:

- Purchase of stock
- Human resource and skills building
- Business development for solar projects

PARTNERS

- UNCDF
- Centenary Bank
- GIZ
- PSFU
- USEA
- USADF
- Innovex
- Kema Power

06 — IMPACT

- ✓ Sold more than 10,836 solar products benefiting over 54,000 people
- ✓ Employs a total of 16 staff
- ✓ Reduction in Co2 emissions from use of kerosene lamps and diesel generators

01 — COMPANY OVERVIEW

Solar Today is a renewable energy company that supplies and installs power back-up systems, streetlights and solar water heaters for both households and institutions. It also designs, supplies, and distributes modular solar products ranging from 30 Wp to 5 kW for households, businesses, institutions and for irrigation and solar water pumping.

Solar Today's vision is to be the leading company in Uganda providing high quality sustainable renewable energy by powering rural communities.

Year of registration: 2012

Location: Mbarara

Branches and locations: 3 branches in Mbarara, Arua and Kampala.

Products

- Solar lanterns, Solar Home Systems, Solar Business solutions, Institutional solar systems, Power back up systems and Solar water heating.

02 — DIRECTORS EDUCATION AND EXPERIENCE

The Directors have a combined experience of more than 25 years' in partnership development, human resource management, credit management, supplier management and product sourcing.

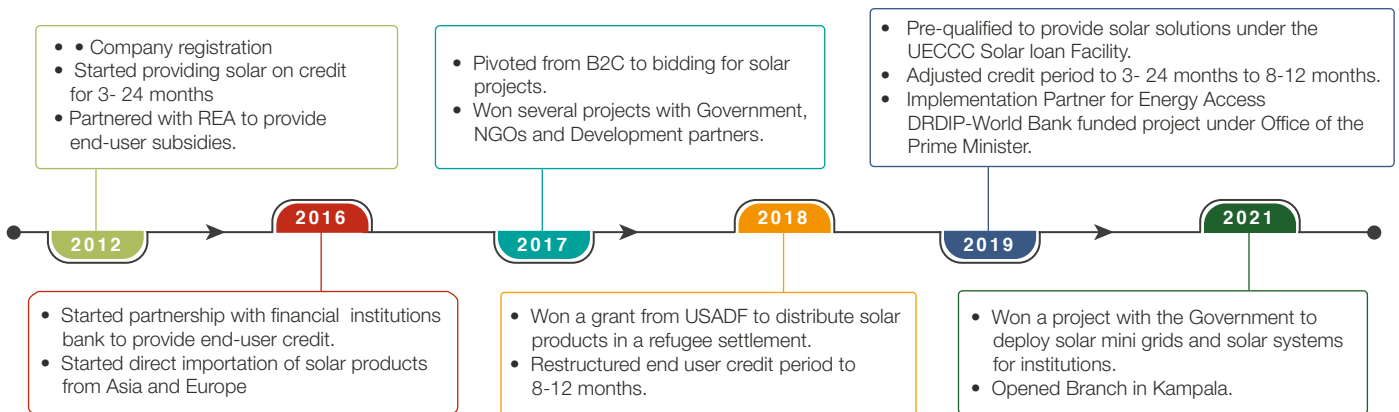
Education background:

Bachelor of Business Administration and Post Graduate in Renewable Energy Development from Heriot-Watt University.

Previous Working Experience:

Worked in the banking, telecommunication and off-grid solar companies.

03 — BUSINESS GROWTH JOURNEY



04 — INVESTMENT NEED

Debt financing of USD \$ 500,000

Use of funds:

- Inventory enhancement to ensure consistent stock levels.

PARTNERS

- Centenary Bank
- Finance Trust Bank
- UECCC
- UNCDF
- Open Capital Advisors
- Office of the Prime Minister
- Managers Without Borders
- USAID/USADF
- USEA

06 — IMPACT

- ✔ Sold and installed over 14,500 solar systems impacting 120,000 lives.
- ✔ Over 10,000 solar products sold on credit.
- ✔ Created employment for 34 youths and Women.
- ✔ Established partnerships with 20 Saccos in Western Uganda.
- ✔ Reduction of Co2 emissions from replacement of use of fossil fuels.

05

VICTRON SOLAR

01 — COMPANY OVERVIEW

Victron Solar Limited is a renewable energy company working with solar energy system design and installation. Initially, the company was focusing on providing solar for lighting purposes, however, Victron Solar has now advanced to Captive solar and solar for productive use, especially in off- grid locations, where their target market is rural health centers.

Year of registration: 2002

Location: Victron House, Magijjiye Zirowwe

Branches and locations: 4 in Kampala, Kayunga Gomba and Mityana.

Products

Pico-solar lanterns, Solar Home systems, Standalone Institutional PV systems, Commercial & Industrial Solar PV, Solar Water heaters and Fridges.

02 — DIRECTORS EDUCATION AND EXPERIENCE

The Management team of Victron Solar Limited, has 20 years of work experience in the solar energy and construction sector.

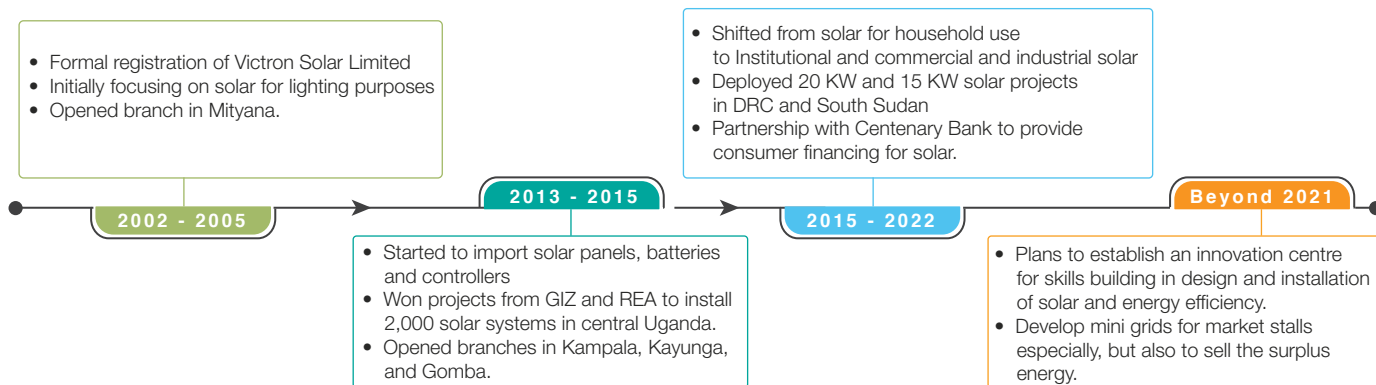
Education background:

The Directors of the company hold degrees in Electrical Engineering, Statistics, Project Planning and Management and diploma in Electronics, respectively.

Previous Working Experience:

Worked in sales and operations for an oil and gas company in Uganda.

03 — BUSINESS GROWTH JOURNEY



04 — INVESTMENT NEED

Company is seeking equity finance of USD \$ 56.000

Use of funds:

- Purchase of solar equipment

PARTNERS

- Centenary Bank
- Rural Electrification Agency
- SENDEA
- CREEC
- USEA
- GIZ

06 — IMPACT

- ✔ Sold and installed over 75.000 systems
- ✔ Employs 11 full time staff.
- ✔ Contributes to reduction of Co2 emissions through reduction in use of diesel generators and kerosene lamps

01 — COMPANY OVERVIEW

Xpreme Solar Solutions- trading as Sunny money was founded in 2014 by a UK based charity. In 2018 the company was transferred to full Ugandan ownership. The Mission is to bring solar systems to rural communities in Uganda so that children can have a bright future.

The company distributes solar lanterns and kits through community projects, financial institutions and schools and teachers who act as their last mile distribution.

Year of registration: 2014

Location: Kampala

Distribution: Schools in 30 districts and partnerships

Product

- Solar lantern and kits
- Stand alone Solar PV systems

02 — DIRECTORS EDUCATION AND EXPERIENCE

The management team has a combined experience of 7 years working in business strategy, operations, financial management, sales as well as solar systems marketing and distribution.

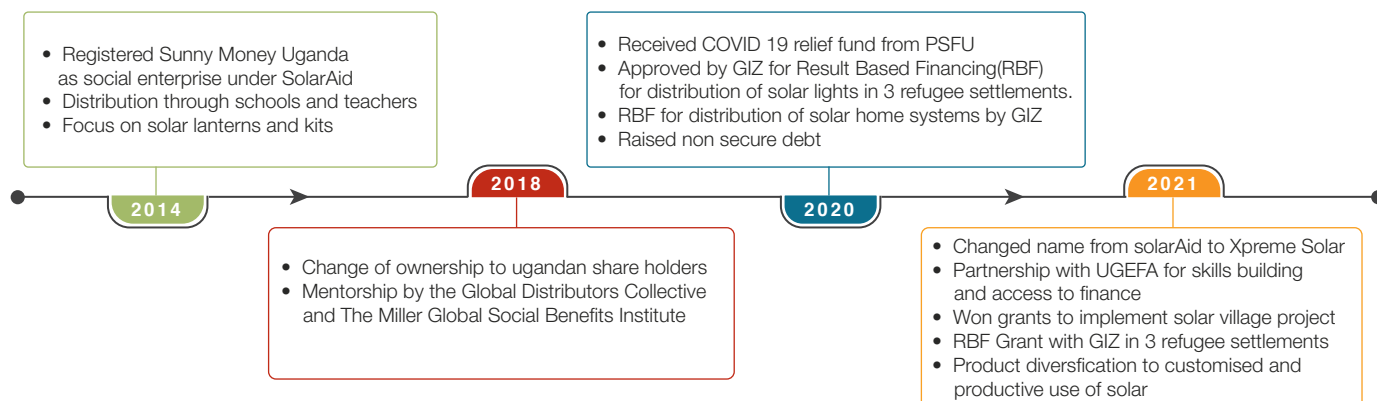
Education background:

The management team has graduate level training in education, project planning and management, Accountant/Finance as well as a Master's Degree in business administration.

Previous Working Experience:

Worked in finance, Audit, insurance, health, Solar and education sectors as Finance manager Auditor and Consultant.

03 — BUSINESS GROWTH JOURNEY



04 — INVESTMENT NEED

Grant and debt of USD \$ 750,000

Use of funds:

- Purchase of solar products
- Expanding distribution network
- Purchase of Vehicle/Van

PARTNERS

- Solar Aid UK
- GIZ
- SENDEA
- USEA
- PSFU
- Global Distributor Collective

06 — IMPACT

- ☑ Sold over 25,000 benefiting over 125,000 people's lives.
- ☑ Employs 15 staff
- ☑ Works with over 30 schools to distribute solar
- ☑ Reduction in Co2 emissions

References

- GOGLA. (2020).** “Off-grid solar investment trends 2019-2020”. Retrieved from: https://www.gogla.org/sites/default/files/resource_docs/off-grid_solar_investment_trends_2019-2020.pdf
- IRENA (2018).** Opportunities to accelerate national energy transitions through advanced deployment of renewables. IRENA. <https://www.irena.org/publications/2018/Nov/Opportunities-to-accelerate-national-energy-transitions-through-advanced-deployment-of-renewables>
- IRENA (2019).** Measuring the socio-economic footprint of the energy transition: The role of supply chains. IRENA. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jan/IRENA_-_Measuring_socio-economic_footprint_2019_summary.pdf?la=en&hash=98F94BCC01598931E91BF49A47969B97ABD374B5
- IRENA (2020).** Measuring the socio-economics of transition: Focus on jobs. IRENA. <https://www.irena.org/publications/2020/Feb/Measuring-the-socioeconomics-of-transition-Focus-on-jobs>
- MEMD. (2020).** “National Electrification Report for Energy for Rural Transformation – ERT III Baseline Survey, 2018”.
- MEMD. (2021).** “National Renewable Energy Platform” (digital pdf copy received from Minsitry of Nergy and Mineral Development.f
- MEMD. (2021).** “RENEWABLE ENERGY POLICIES FOR CITIES: EXPERIENCES IN UGANDA”. Retrieved from: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/May/IRENA_Policies_for_Cities_Uganda_2021.pdf?la=en&hash=B6AF54CF466F70B83E96E9F322C09D8139AF9D03
- Power for All. (2019).** “Renewable Energy Jobs in Sub-Saharan Africa and Asia 2019”. Retrieved from: <https://www.powerforall.org/application/files/8915/6310/7906/Powering-Jobs-Census-2019.pdf>
- SeforAll. (2020).** Recover Better with Sustainable Energy for All, 2020
- SeforALL. (2021).** “2021 Tracking SDG7 Report”. Retrieved from: https://trackingsdg7.esmap.org/data/files/download-documents/2021_tracking_sdg7_report.pdf
- UBOS. (2011).** “Uganda Bureau of Statistics Report on the Census of Business Establishments, 2010/11”. Retrieved from: https://www.ubos.org/wp-content/uploads/publications/03_20182010_COBE_Report.pdf
- UNEP-DTU Partnership. (2021).** Bhamidipati, P. L., Pedersen, M. B., Njoroge, H. N, Strange, L., Nygaard, I., Hansen, U. E., “Local value capture from the energy transition: insights from the Solar PV industry in Kenya”. Retrieved from: <https://unepdtu.org/wp-content/uploads/2021/06/local-value-capture-from-the-energy-transition-insights-from-the-solar-pv-industry-in-kenya.pdf>
- UOMA. (2020).** “Offgrid energy in Uganda: Market Map”. Retrieved from: https://uoma.ug/wp-content/uploads/2020/10/Download-2020-UOMA-Market-map_vFUpdated.pdf
- UOMA. (2021).** “Demand-side barriers to financing for off-grid solar businesses in Uganda”. Retrieved from: <https://uoma.ug/wp-content/uploads/2021/06/UOMA-A2F-DSB-paper-3.pdf>
- Wood Mackenzie. (2020).** “Foresight 20/20: Off-grid renewables,” Retrieved from: <https://www.woodmac.com/reports/power-markets-wood-mackenzie-energy-transition-outlook-2020-highlights-437167>

Unlocking support for local clean energy companies: insights from the solar PV industry in Uganda

