

INVESTOR WORKSHOP

“GENERATING DEAL FLOW IN UGANDA’S SOLAR ENERGY SECTOR TARGETING LOCAL MSMEs”

February 3, 2022 at Mestil Hotel

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UNEP DTU Partnership

UNEP-DTU Partnership is a leading international research and advisory institution on energy, climate and sustainable development. Its work focusses on assisting developing countries transition towards more low carbon development pathways, and supports integration of climate resilience in national development through research, policy and capability activities.

Backed by the Danish Ministry of Foreign Affairs and contributes to UNEPs Programme of Work



OUR FOCUS AREAS



Climate Planning and
Policy



Climate Transparency
and Accountability



Business Models and
Markets

31

Years working with energy and
climate

22

Nationalities represented by our
scientific staff

71

Countries in which we are
currently implementing projects

The TEMARIN Project

TEMARIN: Technology, Markets and Investment
for Low Carbon and Climate Resilient Development

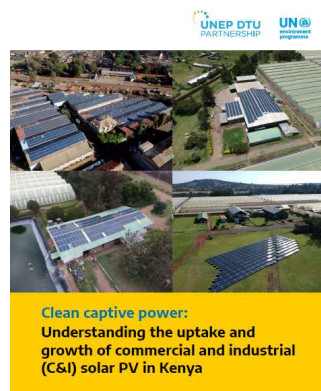
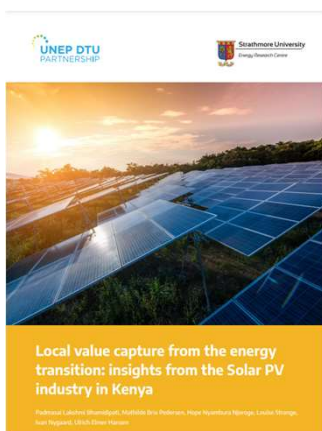
Danida-funded (2019-2022)



MINISTRY OF FOREIGN AFFAIRS
OF DENMARK

Strengthening markets for climate technologies in
Kenya and Uganda

- analyses of market-led interventions
- strengthen domestic markets and industries
- support partnerships for transfer and diffusion



More information about the TEMARIN project at www.unepdtu.org



TEMARIN Project Team



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AGENDA

TIME	AGENDA ITEM	SPEAKERS /NOTES
08:30am - 8:40am	Welcome and Introductions	Eddie Sembatya (Finding XY)
08:40am - 09:00am	Introduction of UNEP DTU Partnership and the TEMARIN project	Introductions from Lakshmi Bhamidipati and Mathilde Brix Pedersen (UNEP DTU Partnership)
09:00am - 09:20am	Remarks from MEMD and UNREEEA	Mr. Alexander Akena (UNREEEA) Amos Tamusuza (MEMD)
09:20am - 10:00am	Presentation on: <ul style="list-style-type: none"> Barriers to financing local MSMEs Unveiling the investment pipeline profiled in the project. 	Facilitated by Julius Magala (UNCDF)
10:00am - 10:20am	Coffee Break	
10:20am - 11:20am	<ul style="list-style-type: none"> Discussion on defining investible pipeline and practical approaches to reducing the funding gap for local solar MSMEs. 	Facilitated by Eddie Sembatya (Finding XY) and Julius Magala (UNCDF)
11:20am - 12:00pm	Feedback from Private Sector Conclusion and Next Steps	Private Sector Representatives. Presented by Eddie Sembatya (Finding XY)



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

Mestil Hotel, Kampala

03rd February 2022

Julius Magala



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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 companies (UOMA, 2020). Despite the high number of locally owned companies, there is insufficient market information to understand the growth journeys, contribution to the solar sector and how they can be supported to address the barriers that hinder them from further contribution to increasing access to electricity.

Further, **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 profiles of interviewed Ugandan-owned companies, provides insights on how they operate and grow, what constraints they continue to face, and ways to strengthen support for these domestic solar companies.

1.2 Introduction

The aim of this report is to contribute to expand knowledge about domestic solar companies and improve the understanding of how to increase the domestic share of the solar market in Uganda.

The **overall 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 companies.

Key questions addressed:

- who are the 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 **selected domestic companies** and sector experts. Further, the preliminary findings were validated through a stakeholder co-creation workshop.

Interviewed solar companies have at least 70% shareholding by Ugandans and have been in operation for more than 5 years. Surveyed companies also serve diverse market segments.






02

Key Findings

- Characteristics of domestic solar companies (age, size, annual turnover)
- Solar PV market segments
- Business models
- Growth Trajectories

2.1 Characteristics of domestic companies (age, size)

Company 	Age 	No of staff 
Access to solar	05	05
All in Trade	13	25
Anuel Energy	06	14
E-Power Solutions	12	12
GRS	11	11
Kambasco Technologies	09	06
Power Trust	10	16
Solar Today	09	24
Xpreme Solar Solutions	07	12
Victron Solar	19	11

-> The interviewed domestic solar companies are **private limited liability** businesses which **experience of 5 – 19 years in promoting access to electricity using solar PV**.

-> **Access to solar is the youngest company** with 5 years while **Victron solar is the oldest** having been in operation for 19 years. The majority of the companies have experience between 9 to 19 years .

-> Domestic solar companies employ a total **130 employees** working in the roles of management, operations, technical services and after sales support. On average they **employ between 5 - 25 full time staff**.

-> Given that the number of employees are **less than 50 employees**, they fall in the **category of medium enterprises** as defined by Uganda Bureau of Statistic (UBOS)⁵.

-> **Gender consideration:** Xpreme solar solutions is **the only Woman owned and led company**. The portion of women in full time employment is (35%) while men comprise 65% of the workforce. The DRE industry is male dominated as globally **women comprise 32% of the work force** (Power for All, 2019).

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

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

-> There are only 2 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 institutions such as Renewable Energy Institute in the UK.

-> In terms of prior work experience, owners **have worked for an average of 5 years** before starting or managing a solar business. They worked in the solar industry, in oil and gas, and telecommunications, among others.

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

Previous Work experience



80% worked in management roles.



70% worked in sales roles.



60% worked in the solar sector.

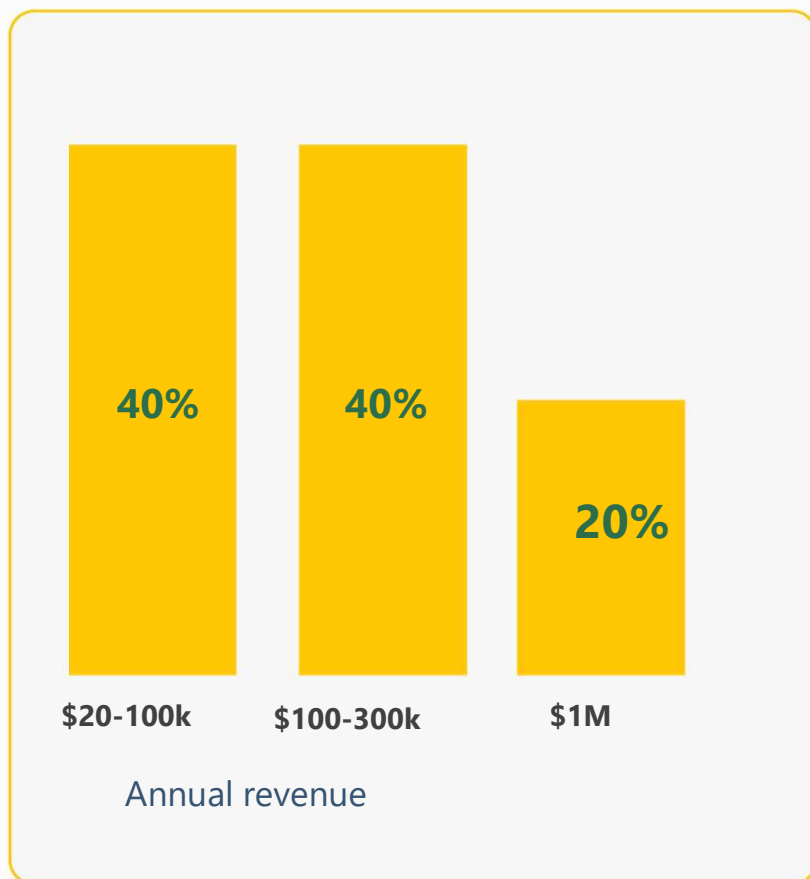


20% have experience in finance, audit and accounting



20% worked as solar engineers and technicians

2.3 Characteristics of domestic companies (revenues)



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.

The annual revenue for 2019 ranges from \$ 20,000 to \$ 1,000,000. The average annual revenue for 2019 was **\$320k**. The annual revenues are self reported by the companies, hence not verified based on audited financial statements.

Most of the revenue is generated from **sales, distribution, installation and maintenance of solar systems and appliances** such as televisions, fridges, water pumps - for household, institutional and business use and electrical installations and **sale of electricity from the solar minigrid**. They also occasionally generate revenue from training and consultancy.

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
Xpreme Solar	●	◐			None
Victron Solar	◐	●	◐		Hybrid solutions, energy efficiency .



Primary market



Secondary market

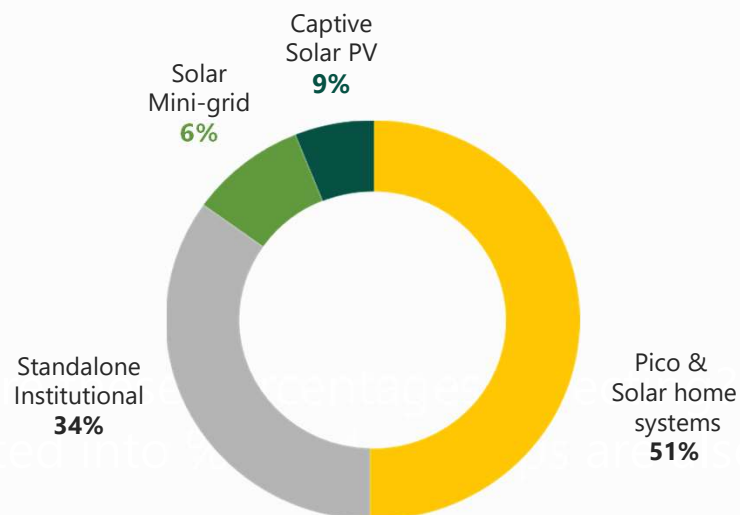
Domestic solar businesses operate across multiple solar PV market segments and offer diversified products and services.

-> Majority of domestic solar companies are mainly serving customers in the pico solar, solar home systems and standalone institutional solar markets.

-> Only 2 companies focuses on captive systems as a primary market and 2 companies serving the minigrid market.

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

2.4 Solar PV Market Segments (2)



Domestic solar companies have **served over 221,102 customers benefiting about 1.1 million people** by 2019.

Products/Units	136,583
Systems installed	83,500
Connections	1,019

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

Most (84%) of the businesses serve **Pico Solar** , **Solar Home System** and **standalone institutional** solar market.

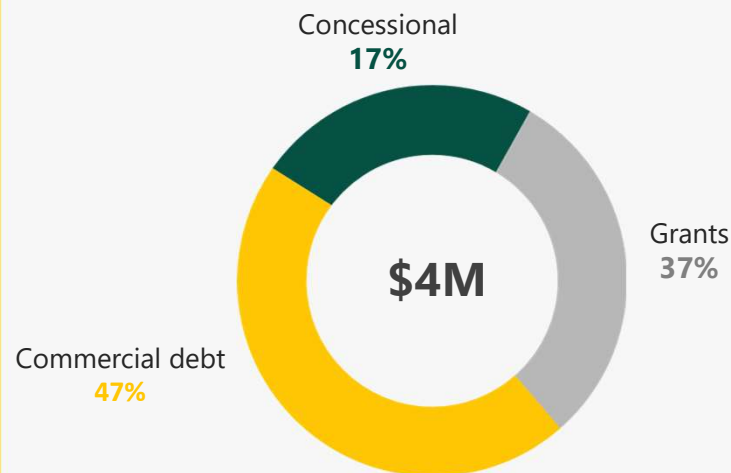
There is an emerging market for **captive solar PV** (9%) and **mini-grids** (6%).

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 ranges for these products: 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, poultry farms, 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 ranges for these systems: 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 projects are installed and sometimes maintained by the domestic solar companies, under agreed operation and maintenance contracts. For consumers, 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 with the size between 10kW and 600 kWp.</p>	<ul style="list-style-type: none"> Installations are sourced majorly through public tenders by Rural Electrification Agency, and 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, with 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 ranges for these systems: 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, but 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. **The total grants received are less than debt as 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 10 domestic companies, **debt financing totalled to USD \$ 2.539 million while grant financing contributed USD \$ 1.461 million of the \$4 Million raised.** More non concessional debt has been raised more than concessional debt.

In terms of number of companies accessing and utilising grants, there were **more businesses that received grant financing.** There are 8 out of the 10 businesses who received grant financing, 6 out of 10 have accessed debt finance of which 3 transactions were for concessional debt and only 3 businesses raised both grants and debt.

Ticket sizes

Loan: **\$ 10,000 - \$ 200,000**

Grant: **\$ 30,000 - \$ 150,000**

Tenure: 1 – 3 years for both loans and grants

Use of funds: Loan are used for working capital especial importation of solar products and appliances while Grants are mainly for innovations and business expansion into untapped areas and emergency relief.

No domestic company has raised external equity raised

2.7 Sources of funding and process

- Commercial debt providers are **Centenary bank** and **premier credit, Maisha Financial services and Village SACCOS**
- 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 mainly request for loan application and collateral security of more than 100% of the loan value as requirements for processing of the loan.

Local solar businesses are using their land as collateral with support from guarantees provided by development organisations.

Besides the above mentioned 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.






2.9 Growth trajectories

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. Here 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 distribution• 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

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

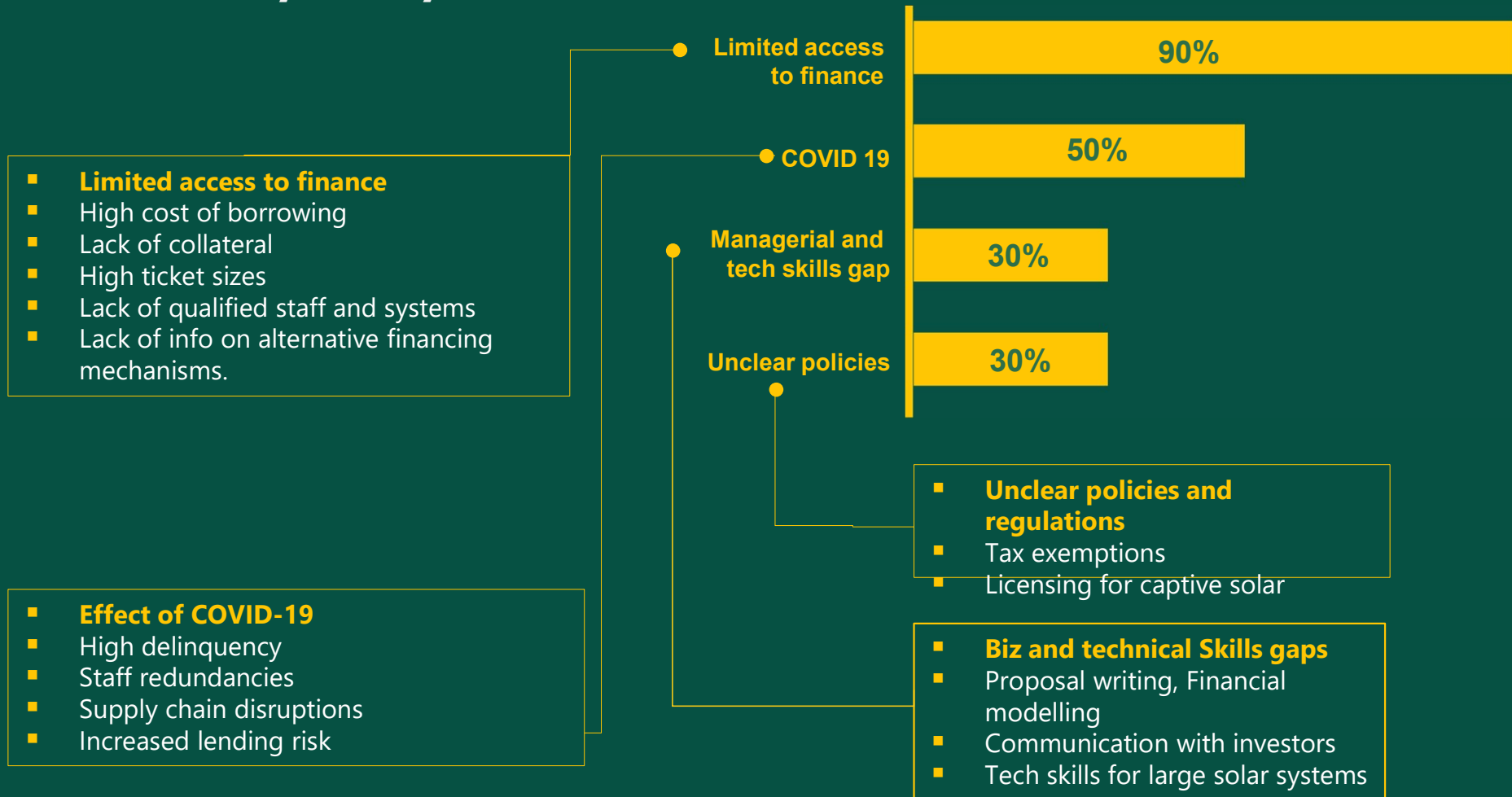
 Modification of business models.	<ul style="list-style-type: none">• GRS started by developing biomass minigrids but later changed to Solar PV minigrids.• E- power solutions and Power trust started importation of solar products instead of local sourcing.• Solar Today: Partnerships with Financial institutions.
 Focus on last mile distribution	<ul style="list-style-type: none">• Solar Today, Victron solar and Power trust have set up a total of 12 branches across the country.• Access to solar, Anuel Energy and Xpreme Solar Solutions are using more than 65 community based agents to reach their customers.
 Transitioning into newer markets, larger-scale systems	<ul style="list-style-type: none">• All in Trade: SHS- Institutional- Captive C&I Solar- Minigrids• Victron Solar : SHS and Institutional solar systems to Captive C&I Solar PV.• Kambasco: SHS and Institutional solar to minigrids.
 Offering complementary allied products and services:	<ul style="list-style-type: none">• Anuel Energy: Barber salon kits and water pumps• E- Power solutions: Water heaters and solar water pumps.• Power Trust: Water heaters, Solar power mills, fridges• Kambasco: Electric vehicle charging stations
 Use of digital tools	<ul style="list-style-type: none">• Anuel: App for sales management• Kambasco: Digital solution for credit assessment and scoring for solar loans• Power Trust: Integration of PAYGO into large solar systems.

03

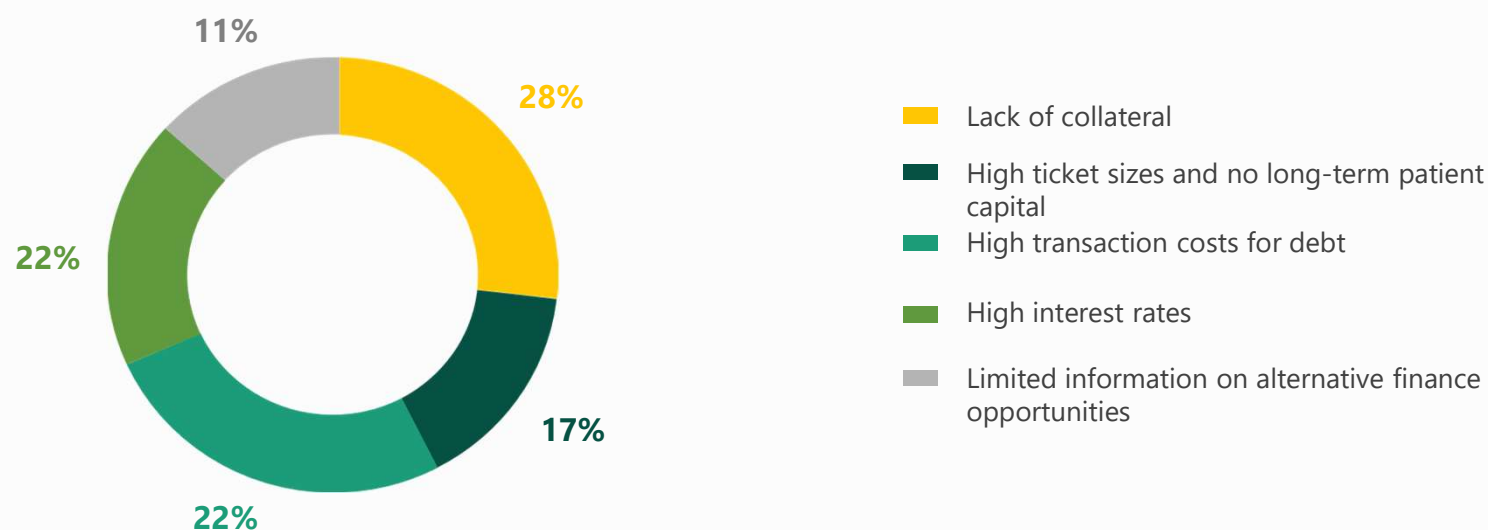
Constraints for continued business growth

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

3.1 Summary of key constraints



3.2 Deep dive into 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 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.

(source: <https://uoma.ug/wp-content/uploads/2021/06/UOMA-A2F-DSB-paper-3.pdf>).

4.4 Deep dive into the 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.**
- With the advancement in solar PV technology, domestic solar companies need to re-train and build new and 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

Key management skills gaps

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

Key technical skills gaps

- There is a lack of technical **skills for design, installation and operational 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

Recommendations

- Recommendations for stakeholder groups
- Industry Associations, Local banks and Investors
- Government, Development partners

4.1 Recommendations to stakeholders (1)

Industrial associations

- Research and collect sector and company level information to inform and lobby for better policies, support skill-building, and support businesses in attracting investments.
- Use existing platforms such as NREP to build an investible pipeline, prepare businesses for investment readiness and share investment opportunities
- Co-organize workshops with investors to share information on why proposals are not successful and develop solutions
- Encourage and support its members to build a good track record for repayment of loans, improve governance and management structures and tax compliance.

Local banks and Investors

- Tailor existing loan products and de-risking instruments to the needs of domestic businesses
- Develop integrated green finance strategies to support innovations and address challenges faced by domestic businesses e.g., aggregation of deals
- Partnership with BD service providers to support in investment readiness for businesses or provision of technical assistance for pipeline building.
- Facilitate staff to attend specialized trainings in renewable energy or climate to build inhouse capacity.

4.2 Recommendations to stakeholder groups (2)

Universities, TVETs and Research organisations

- Carry out comprehensive needs assessment to develop tailored and accredited training programmes
- Develop and facilitate trainings for not on technical aspects but also business and financial management.
- Develop and accredit advanced trainings in solar minigrid, captive solar and productive use of solar such as water pumping
- Invest in training of trainer's programmes to build competent facilitators and trainers
- Develop shared learning spaces with shared tools for technical training to avoid the high costs of training tools and reach more training participants.

Government and Development partners

- Streamline guidelines for integration of local content in the solar sector.
- Develop integrated strategies, plans and programme between MEMD and MOTIC to strengthen capacities of domestic businesses
- Tailor programmes and initiatives based on understanding of needs for domestic solar businesses
- Use of local implementing partners, structure and human resource for skills and technology transfer and retention.
- Support needs assessments, curriculum building and accreditation and research to understand why de-risking instruments are underutilized and how uptake can be increased.

05

Investment pipeline

- Profile of investments
- Investment need and use of funds

5.1 Investment Pipeline – Snapshot

Track record



10 solar companies with a track record of 5 – 19 years.

Sold over 221,000 solar products.

Coverage



National wide coverage with **over 12 branches** and over 65 sales agents and partnerships across the country

Investment need



USD 5.86 Million for business consolidation and expansion.

Tenures between 1 to 5 years.

Impact to be delivered

- Increasing access to electricity (opportunity- 68% unelectrified in rural areas and 29% in urban areas, and 2.3 MW of C&I)
- Reduced costs of kerosene lamps, diesel generators and grid electricity
- Skills building and Job creation in management and technical roles (SHS 5,500- 9,200, MG- 3,600- 57400)
- Improved health for women and children by reducing indoor air pollution
- Contribution to climate change mitigation by Offsetting of Co2 emissions

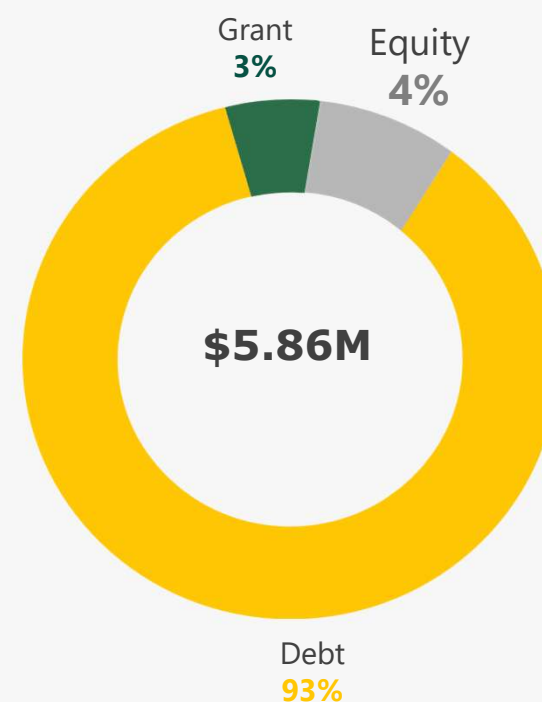
5.2 Investment Pipeline – Financing instrument and markets

- The **high appetite for debt (93%)** could be an indication of the maturity of the businesses, or the lack of alternative sources of capital. There is need for grants and equity (7%) but seem to be underestimated because of the limited opportunities.
- Ticket sizes range between **\$50k to \$2.7 Million** to be used for purchase of solar products, and marketing.
- **Large institutional solar market segment accounts for the highest demand for capital at 69%**, followed by **pico and standalone solar systems at 17%** with captive solar and minigrids accounting for the lowest demand at **9% and 5% respectively**.
- The quality of the investment pipeline has not been assessed, therefore the investible need is subject to further discussions with the businesses.

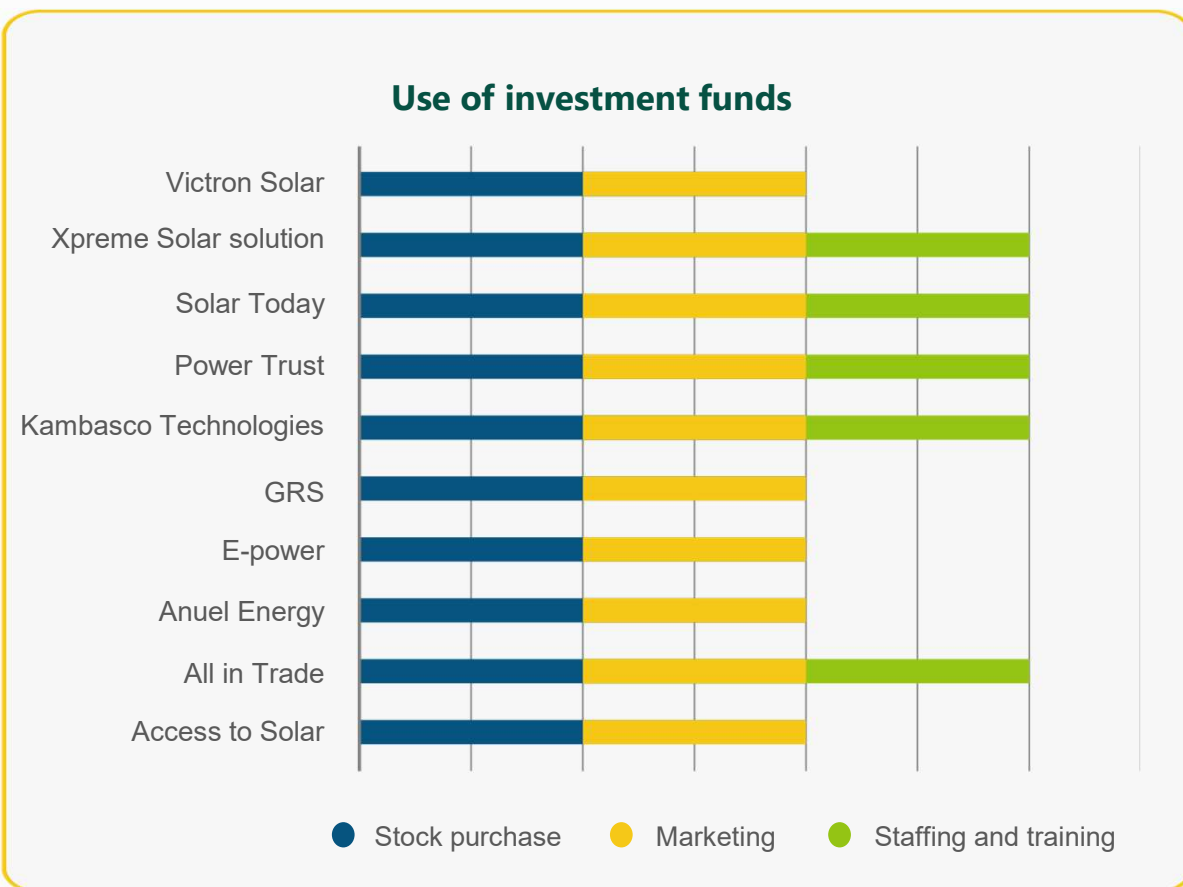
Investment pipeline by market segments

Markets	Pico and SHS	Large Institutional	Captive C&I solar	Minigrids
Invest. Need \$	1,000,000	4,066,000	500,000	300,000
Percentage	17%	69%	9%	5%

Investment Pipeline by financing instrument



5.3 Investment Pipeline – Use of funds



Domestic solar companies plan to use the funds for stock purchase, marketing and hiring new staff and training.

▪ **Stock purchase**

Importation of own branded or existing branded solar products and components and appliances such as Radios, TVs, fridges, water pumps and ice flake production machines.

▪ **Marketing**

Building a distribution network through own networks and partnerships with financiers, communities, not for profits and private businesses in the energy-nexus and promotion to increase awareness, build a pipeline of projects and acquire more customers in different market segments.

▪ **Staffing and training**

Growing the teams by recruiting senior managers, sales and technical personnel for roles such as Chief Finance Officer, Business Development Manager, Sales officers, technical managers and electrical and water engineers. These staff also need to be equipped with the required management, business and technical skills through training and mentorship.

Thank you!!

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