

Stand Alone Solar (SAS)

MARKET UPDATE

Zambia

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Africa Clean Energy
Catalysing Africa's Solar Markets



TETRA TECH
International Development





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Cover page: Steven Miyoba shows the solar panel on his roof, which he bought from Fenix International and pays for through mobile money. Photo courtesy: www.bgfz.org

The Zambia Stand-Alone Solar Market Update is one of a series of 14 national briefings published by the Africa Clean Energy (ACE) Technical Assistance Facility (TAF) to give stakeholders a snapshot of recent developments in the stand-alone solar sector, including those arising from the COVID-19 pandemic.

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CONTENTS

Abbreviations And Acronyms	v
Executive Summary	vi
1 National Overview	1
1.1 Current Context	1
1.2 Energy Access	1
2 Demand-Side: Consumer Insights	2
2.1 Willingness and Ability to Pay	2
2.2 Impact of COVID-19	2
2.3 Consumer Awareness	2
3 Supply-Side: Stand-Alone Solar Companies	4
3.1 Pico-solar and Solar Home Systems	4
3.2 Productive Use Systems	5
3.3 Solar Industry Association Zambia	6
4 Political Framework	7
4.1 Government Institutions	7
4.2 Energy Policy and Regulation	8
4.3 E-waste Regulation	8
4.4 Financial and Mobile Payment Regulation	8
4.5 Gender and Social Inclusion Mainstreaming Regulation	9
5 Financing	10
5.1 Supply Chain Financing	10
5.2 Consumer Financing	11
6 Market Support	12
6.1 Development Partners	13
6.2 Training Institutions, Incubators, Accelerators	13
6.3 Market Data	13





LIST OF TABLES

Table 1: Energy access	1
Table 2: Major and active SAS companies	5
Table 3: Government institutions in the SAS sector	7
Table 4: Policies and regulations in the SAS sector	8
Table 5: Available financing for SAS	10
Table 6: Development partners in the SAS sector	12

LIST OF FIGURES

Figure 1: Zambia at a glance	vii
Figure 2: SAS sales	4



ABBREVIATIONS AND ACRONYMS

Acronym	Definition
ACE TAF	Africa Clean Energy Technical Assistance Facility
BGFZ	Beyond the Grid Fund for Zambia
BoZ	Bank of Zambia
ERB	Energy Regulation Board
ESAP	Electricity Services Access Project
EUR	Euro
GDP	Gross Domestic Product
MFIs	Microfinance Institutions
MoE	Ministry of Energy
MoH	Ministry of Health
MSMEs	Micro, Small and Medium Enterprises
PAYG	Pay-As-You-Go
REA	Rural Electrification Authority
REMP	Rural Electrification Master Plan
SAS	Stand-Alone Solar
SCT	Social Cash Transfer
SHS	Solar Home System
SIAZ	Solar Industry Association Zambia
USAID	United States Agency for International Development
SIDA	Swedish International Development Cooperation Agency
USD	United States Dollar
ZESCO	Zambia Electricity Supply Corporation
ZICTA	Zambia Information and Communications Technology Authority
ZMW	Zambian Kwacha
ZOGTF	Zambia Off-Grid Energy Task Force



EXECUTIVE SUMMARY

Recent local and international economic dynamics, including fast rising expenditures, a fiscal deficit, low copper prices, poor agricultural output and an electricity supply crisis have left Zambia vulnerable. Pressure on the Zambian economy resulting from the debt crisis has been further worsened by COVID-19. However, it is expected that the country's copper exports could help its post pandemic economic recovery.

Despite mobile phone penetration of 104 phones per 100 inhabitants, the mobile network coverage in rural Zambia remains limited. In the first half of 2020, mobile money transactions increased from ZMW18.99 billion to ZMW43 billion (126 per cent increase)¹ pointing to its significant service potential. This is especially useful for the SAS sector as it looks for ways of financing low-income consumers.

To meet the country's Vision 2030 electrification goal, the off-grid sector will play an important role in increasing access to 51 per cent in rural (currently 4.5 per cent); and approximately 90 per cent of urban (currently 66 per cent) of the Zambian population through a suite of solutions.² While rural and peri-urban households seem aware of stand-alone solar (SAS) products and are in favour of their use, 61 per cent of unelectrified Zambians still cite the cost of solar home systems (SHS) as a barrier to purchase. This is despite other notable reasons for preference of SAS products including lower cost compared to electricity from ZESCO, which currently has 1.1 million connected customers.

The COVID-19 pandemic has only worsened households' ability to acquire SHS products, with many citing difficulties in servicing existing loans. SAS companies are similarly restrained in their ability to support their customers because of the impact of COVID-19 on their operations. For example, border closures resulted in storage costs and delayed consignment deliveries. Similarly, in-country movement restrictions resulted in company agent and sales personnel experiencing difficulties servicing their customers. Other challenges SAS companies face include threats to worker and customer retention due to the pandemic, lack of solar specific financing, limited policy protections, exposure to currency risks and high lending rates from microfinance institutions (MFIs).

The Zambian SAS sector has seen an increase in businesses and an equally high number of development partners supporting the government's ambitions to catalyse investment in SAS with the aim of diversifying the country's energy mix. In the wake of COVID-19, development partners' response has been largely positive and aimed at easing the financial burden on both SAS companies and their customers through loans and grants and technical assistance. However, many of these initiatives are in their infancy and more data will be needed in order to better identify and target interventions. Areas in clear need of support include: gendered financial inclusion and SAS acquisition, capacity building, and mitigating last-mile distribution costs.



Despite mobile phone penetration of 104 phones per 100 inhabitants, the mobile network coverage in rural Zambia remains limited. In the first half of 2020, mobile money transactions increased from **ZMW18.99 billion to ZMW43 billion (126 per cent increase)** pointing to its significant service potential.

1.

2. ACE TAF (2019). *Market assessment: Zambia*.



Figure 1: Zambia at a glance

i. World Bank (2018) Population data

ii. ESMAP (2019) Regulatory Indicators for Sustainable Energy

iii. Lighting Global (2019) Pay-As-You-Go Market Attractiveness Index Report

iv. World Bank (2018) Population data

1. NATIONAL OVERVIEW

1.1 Current Context

Zambians head to the polls in August 2021. The government's focus remains on the challenging debt crisis that will likely be worsened by COVID-19. Should world copper prices recover, copper exports may help its post pandemic economic recovery. The Zambian government has also pledged to postpone new concessional loans and increase revenues in an effort to service its external debt, which saw inflation rise to 9.8 per cent in 2019. Zambia's total external debt stood at USD27.3 billion, including USD11 billion of public and publicly guaranteed debt.³

Zambia is ranked number 85 in the 2020 Ease of Doing Business Index, a slight improvement from position 87 in 2019. A number of reforms, such as protecting minority shareholders and resolving insolvency, were behind this improvement.⁴ Its economy is highly dependent on copper mining, which accounts for 70 per cent of export revenue and 10 per cent contribution to the Gross Domestic Product (GDP). However, local and international dynamics, including fast rising expenditures, a fiscal deficit, low copper prices, poor agricultural output and an electricity supply crisis have left the country vulnerable. The agricultural sector also contributes to Zambia's economy – though it accounts for just 2.6 per cent of the country's GDP, it employs 54 per cent of its workforce.⁵ The agriculture sector provides an opportunity for productive use products to improve the sector. The services sector contributes 54.1 per cent to national GDP.

1.2 Energy Access

The Zambian government has identified electricity access as an important driver of economic development

throughout the country in its Vision 2030 master plan. Zambia has 2,800MW of installed electricity generation capacity (85 per cent is hydro) but erratic rains, declining water levels in the Kariba Dam and an increasing population have resulted in a severe supply deficit. The country's electricity demand has been rising by more than 6 per cent (or 150-200MW) per year for the past decade.⁶

Although there are pockets of private sector activity in generation, transmission and distribution, the bulk of power generation and distribution in Zambia is carried out by Zambia Electricity Supply Corporation (ZESCO).⁷ The mining sector consumes the bulk of electricity in the country.

With an unelectrified population of 11 million,⁸ there is significant potential for off-grid electrification. The renewable energy sector is opening up to new independent power producers (IPPs) for on-grid and off-grid transactions. The government expects to bring online additional power through solar, hydro and thermal. The off-grid sector is expected to play an active role in providing access to approximately 66 per cent of the Zambian population through a suite of solutions, including solar home systems (SHS).⁹ An installed capacity up to 1,176MW from photovoltaic (PV) and 1,200MW from wind can be integrated by 2025. These capacities can be increased to 1,376MW from PV and 1,400MW from wind by 2030. However, even this will not be enough to meet the country's demand, therefore, an additional capacity from other sources (e.g. hydropower) shall be integrated to achieve this target (about 600MW with 30 per cent capacity factor by 2030).¹⁰

Table 1: Energy access

Grid connections (%)	31% (4% rural; 67% urban) ¹¹
Unelectrified population	11 million ¹²
Grid tariff per kWh	EUR0.013 (USD0.016) up to 200kWh and EUR0.075 (USD0.091) above 200kWh ¹³

3.

4.

5. USAID (2020). *Zambia energy sector overview*.

6. Almeida, M. (2020) Q&A with Alexander Filippov: What were doing to promote Zambian Renewable Energy, <https://dt-global.com/company/blog/december-16th-2020/renewable-energy-zambia>

7. ACE TAF (2019). *Market assessment: Zambia*.

8. International Energy Agency (2020) *World Energy Outlook*

9. USAID Geospatial tool to guide the Zambian energy sector.

10.

11. ACE TAF (2019). *Market assessment: Zambia*.

12. IEA (2020). *World Energy Outlook*.

13. World Bank (2020). *Cooking with electricity – A cost perspective*.

2. DEMAND-SIDE: CONSUMER INSIGHTS

The World Bank has recently estimated that there are two million households at Tier 0 (no access) in Zambia, of which 1.6 million are rural and 400,000 urban.¹⁴

2.1 Willingness and Ability to Pay

According to data from 60 Decibels, concern on the impact of COVID 19 and coping with the uncertainty of the pandemic among lower income families whose financial situations have been most affected by the pandemic, has steadily increased from 78 to 100 per cent (May to August 2020). The main concern areas are economic (ability to earn an income and the global economy) followed by concerns around individuals and their family health. Interestingly, concern rates have on average been higher amongst men than women. This is likely attributable to the fact that 68 per cent of companies' customers are men.¹⁵

A 2019 nationwide survey of both urban and rural Zambian households found that 40 per cent of respondents already owned a solar product – 18 to 35 per cent of rural households stated willingness to pay for a basic SHS product at an approximate cost of USD7, with 32 per cent of them willing to buy on pay-as-you-go (PAYG) basis.¹⁶ This is a 100 per cent increase from the 15 per cent established by the Rural Electrification Master Plan (REMP), 2008¹⁷ analysis of households in rural Zambia willing to pay USD5 per month for SHS.

2.2 Impact of COVID-19

COVID-19 has left 43 per cent of Zambians very vulnerable and 6 per cent extremely vulnerable.¹⁸ Women make up about half of the very vulnerable

group. To cope with their vulnerability, 59 per cent (men and women alike) report using their savings while 62 per cent borrowed money, and this can also be seen in a 6 per cent reduction in PAYG loan repayments. Although unsubstantiated in literature, it is possible that some vulnerable individuals¹⁹ are drawing on the Social Cash Transfer (SCT) programme. The SCT was introduced by the government in 2003 with an aim of reducing extreme poverty by providing regular cash transfers of ZMW90 (about USD4) to vulnerable households.²⁰ With the support of the United Nations and Ministry of Community Development and Social Services (MCDSS), the programme has recently been expanded to address natural disasters and COVID-19 through separate emergency cash transfer initiatives to 249,200 households (approximately 1.2 million people) across 18 districts.²¹

Customer facing interventions to help cushion impacts have been affected by many SAS companies' ability to operate normally because they, too, have been severely affected by COVID-19 control measures. Notwithstanding this, customers' repayment rates dropped only slightly between May and July 2020 (from 84 per cent to 79 per cent). Though customers' repayment rates remain consistent, 59 per cent of them reported (re)payment as somewhat of a burden.²²

2.3 Consumer Awareness

Rural (and partially peri-urban) households are a key target market due to their limited of access to the grid. A United States Agency for International Development (USAID) 2019 report on SHS affordability indicates high awareness rates of solar products, with 83 per cent of

closely to the newer IEA figures of 11 million unelectrified people, if we divide by typical household size.

19. SCT considers vulnerable households as those that include persons with a disability, the elderly (above 65 years old), the chronically ill in palliative care, households headed by females with three or more children, and child-headed households.

20. Kampamba, R. et.al (2019). *Financing the Zambia social cash transfer scale-up: A tax benefit microsimulation analysis based on MicroZAMOD. Wider Working Paper 2019/9.*

rural households knowing about solar energy (slightly higher than peri-urban areas at 80 per cent). Among solar product users, 63 per cent cite lighting as the most valuable solar product.²³

Perception of solar is generally positive, with 59 per cent preferring it to power from ZESCO for the following reasons:

- ◆ Solar is relatively cheaper, particularly on PAYG.
- ◆ The acquisition and installation processes of solar are less cumbersome.
- ◆ Once paid off, the use of solar is free.
- ◆ ZESCO communal²⁴ is seen as unfair since bills do not reflect actual consumption.
- ◆ A 2019 mapping study of the off-grid market in Zambia presents contrasting findings, citing low consumer awareness of the potential benefits of using renewable technology due to a lack of information on their availability.²⁵ Similarly, discussions with the Rural Electrification Authority (REA) indicate a negative perception of solar due to the following:

- ◆ Feeling that it is inferior to the grid.
- ◆ Poor quality products.
- ◆ Limited economic capacity by communities to meet capital investment costs for suitable solar energy systems.
- ◆ Unprofessional or incompetent installation of systems by unqualified persons.
- ◆ General misapplication or misuse of solar systems and vandalism.

The 61 per cent of unelectrified, non-SHS households cited affordability as the main barrier,²⁶ suggesting that improved affordability can result in higher household SHS purchase. The increased ZESCO load-shedding in 2019 pushed many urban households to purchase SHS as backup systems, particularly for lighting and phone charging.²⁷ This may be attributed to the fact that since the COVID-19 pandemic started they are spending more time at home, but it may also be in an attempt to use less grid electricity as a cost saving measure.



Steven Miyoba shows the solar panel on his roof, which he bought from Fenix International and pays for through mobile money. Photo courtesy: www.bgfz.org

24. A ZESCO connection scheme where multiple households share a single meter and the monthly bill is evenly split across the connected households irrespective of varying degrees of usage i.e. House A (high electricity consumer) and House B (low electricity consumer) evenly split the monthly bill.

27. Interview with Acting Principal Energy Officer Ministry of Energy (MoE) in December 2020.

3. SUPPLY-SIDE: STAND-ALONE SOLAR COMPANIES

3.1 Pico-solar and Solar Home Systems (SHS)

Zambia ranks third among the top 10 country markets by volume of PAYG products sold. This is an improvement from the seventh position it held in the first half of 2018.²⁸ The country’s steadily expanding market is likely due to new funding for electrification through solar lighting products, largely through donor procurements.

Solar lighting at health facilities seems to have taken off on the back of the COVID-19 pandemic, with Sunny Money pioneering lighting in public clinics and small health centres in rural areas with their pico and SHS products through a partnership with the Ministry of Health (MoH). Sunny Money is also using its agent network to text customers with information on COVID-19 prevention.²⁹

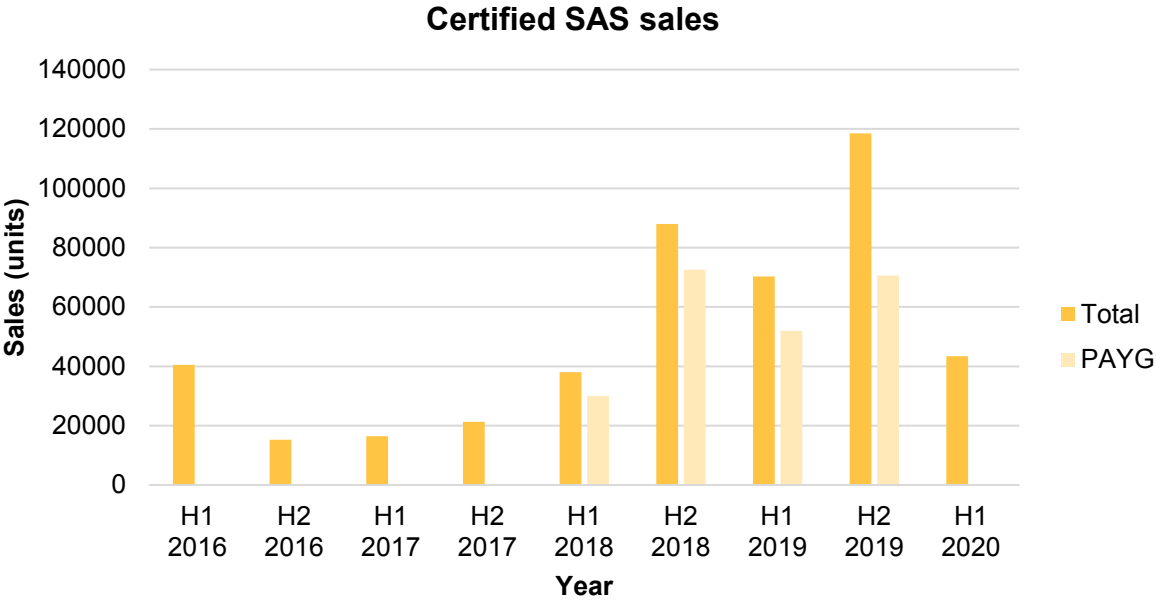


Figure 2: Certified SAS sales (Source: GOGLA)

The COVID-19 burden on customer repayment³⁰ has been heavy – 12 per cent of customers said they were struggling during the crisis, compared to 4 per cent pre-pandemic. Despite the spike, 69 per cent of customers said they were confident of making advance repayments, which suggests a high prioritisation of servicing their loans. At the same time, 49 per cent of

customers reported a higher use of their SHS since the onset of the pandemic.

According to the Energy Regulation Board (ERB), in 2014, there were 31 licensed solar companies. While an updated list of registered solar companies is not available from the ERB, Table 2 presents some currently active in the country.

28. GOGLA (2019). Global Off-Grid Solar Market Report Semi-Annual Sales and Impact Data. January – June.

Table 2: Major and active SAS companies³¹

Company	Business model	Brand/product focus	Comments
Sunny Money	PAYG	Green Light Planet, Jua Solar, d-light, ovSolar	Also has operations in Malawi and Uganda.
Supa Moto	PAYG	Green Light Planet, BioLite	Distributor of solar laptops and mini-computer products.
Vitalite	PAYG	SHS: Fosera, BOS	Recent changes in company directorship.
Fenix International	PAYG	Fenix Power systems	Entered Zambian market in February 2018.
Azuri	PAYG	Azuri solar TV	Launched PAYG in June 2019.
Muhanya Solar	Cash	Wind turbines, SunDazer chest freezer and refrigeration, Rolls battery, Surrette battery, Deka solar gel battery, photovoltaic (PV) solar water pump	Offers solar PV training in collaboration with African Energy, USA.
Wide Energy Africa	PAYG	d-light SHS	Female-led solar distributor.
RDG Zambia	PAYG	RDG	Entered Zambian market in 2018.
Suntech Appropriate Technology	Cash	d-light; Laskaris Solair Solar Geysers; Shakti solar submersible pumps	Small, medium and large scale solar, power back-up and hybrid systems.
Sunray Power Company	Cash	Solar charge controllers, inverters, lights products and pumps	Online shopping available.
Kazang Solar Limited	PAYG	SHS	A subsidiary of Kazang, which is the biggest distributor of electronic airtime with over 3,500 terminals in the country.

3.2 Productive Use Systems

The most (relatively) developed productive use of energy (PUE) activity areas in Zambia are hammer milling, solar water pumping and more recently solar lighting for health facilities. There are a number of solar water pump distributors, though data on proximity to river and settlement density is needed to establish the national solar pumping and irrigation market potential.³²

There is one solar hammer milling product on the market – AGSOL – whose Zambian partner is Rent to Own. It is used predominantly for maize milling. Distribution remains low but the distributor will offer financial, technical and sales and marketing support on behalf of its partner.³³

In its partnership with MoH, Sunny Money is also donating SHS with phone charging capabilities for the ministry to use at border quarantine centres and testing sites.³⁴

31. The list is not exhaustive.

32. USAID (2020). Zambia energy sector overview.

3.3 Solar Industry Association Zambia (SIAZ)

SIAZ was launched in 2019 to provide input and guidance to the rapidly growing solar private sector's development strategy. It has 40 registered members (solar companies) though the details of their operations are unclear. SIAZ activities focus on working with the government to develop policy and regulations that will promote the solar industry and best practice among its members.

When the COVID-19 pandemic broke out, the government imposed a partial lock-down that forced solar companies to slow down or close many of their operations. However, through the lobbying of SIAZ and the Africa Mini-grid Developers Association (AMDA), with support from the Zambia Off-Grid Energy Task Force (ZOGTF), which SIAZ is a member of, as well as programmes like the Africa Clean Energy Technical Assistance Facility (ACE TAF) and Southern Africa Energy Programme (SAEP), solar companies were classified as essential service providers, allowing them to remain open and operational.³⁵



Photo courtesy: www.lightingafrica.org

35. Interview with ZOGTF member in January 2021.

4. POLITICAL FRAMEWORK

4.1 Government Institutions

In February 2018, the Ministry of Energy established ZOGTF, which is made up of six government representatives, eight cooperating partners and five members representing the private sector, making a total of 19 permanent members. The purpose of ZOGTF is

to coordinate and provide oversight on initiatives in the off-grid sector in Zambia. ZOGTF creates a space for more coordinated actions between the government and partners.³⁶ The following table highlights key government institutions in the SAS sector.

Table 3: Government institutions in the SAS sector

Institution	Description and recent activity
Energy Regulation Board (ERB)	There have been issues of lack of consistency in licensing procedures and lack of clarity among off-grid developers and issuing authorities concerning license requirements, timelines, entry points and the licensing process. These processes have been under review and Zambia has launched an off-grid electricity portal ³⁷ which provides an overview of licensing and permitting requirements. Applications for licenses and permits, however, must still be made physically at the issuing authorities, which increases costs for those companies not based in the capital.
Rural Electrification Authority (REA)	Implementation of the REMP has stalled due to a lack of funds and changes in project planning objectives (owing in part to political considerations). ³⁸
Development Bank of Zambia (DBZ)	Managing the Electricity Services Access Project (ESAP) guarantee provided by the World Bank over 7 years. The value of the project is up to USD2.5 million to support increased PV electricity generation capacity by supporting working capital requirements of renewable energy companies (ranging from SHS to mini-grid). Expected impact is to drop interest rate to lower than 12 per cent.
Zambia Revenue Authority (ZRA)	There is a marked improvement on import codes but still limited clarity with regards to some solar components. For example, distributors have found irregularities in the taxation of solar radios in SHS kits and SHS batteries. This inconsistency is attributed to different ZRA authorities using differing import codes. ³⁹ Greater transparency and co-ordination with ERB is needed. ACE TAF support the government to clarify the tax and duty exemptions for a range of SAS products being sold in Zambia through the development of a Customs handbook.
Zambia Electricity Supply Corporation (ZESCO)	The electricity utility is itself promoting solar energy awareness, particularly solar lighting. ZESCO headquarters have installed a solar panel on the roof of their offices.

36. ACE-TAF (2020). *Coordination in Africa's off-grid sector is accelerating progress towards universal energy access.*

37.

38.

39. *Interview with Acting Principal Energy Officer (MoE) in December 2020.*

4.2 Energy Policy and Regulation

The Ministry of Energy launched the National Energy Policy 2019 on February 18, 2020 aimed at achieving optimal energy resource utilisation for both domestic

and non-domestic needs, and establish Zambia as a net exporter of energy. It officially recognises off-grid electrification approaches as a complement to grid extension.

Table 4: Recent activities in the SAS regulatory environment

Policy/ Regulation	Description and recent activity	Relevance to SAS sector
National Energy Policy, 2019	<p>Promotes greater use of solar energy. The previous (2008) policy fell short of recognising increased access to technologies such as net metering and free access to the grid.</p> <p>Currently running an animated radio programme sponsored by the International Labour Organization (ILO) to communicate the policy and what prompted its revision to all Zambians in an interactive manner.⁴⁰</p>	<p>National Renewable Energy Strategy is under development and includes targets to generate 100MW from solar by 2030. In addition, it is envisaged that 500,000 SHS will be distributed, and 350,000 solar water heaters installed.⁴¹</p> <p>Although Renewable Energy Feed-In Tariff (REFIT) strategy was targeted at large-scale renewable energy, its promotion resulted in greater awareness of solar energy and SHS, which has contributed to their increased uptake.</p>
Rural Electrification Master Plan (REMP) 2008-2030	<p>A blueprint for rural electrification. Aims to increase rural energy access to 51%, Implemented by REA.</p>	<p>Aims to increase electrification levels in rural areas from 3 to 8%. One of its key activities is installation of SHS.⁴²</p>
The Value Added Tax (VAT) Zero-rating (Amendment) Order Statutory Instrument No. 88 of 2019	<p>Effective January 1, 2020, it zero-rates energy-saving appliances, machinery and equipment.</p> <p>The government, with support from ACE TAF, is currently reviewing and updating Statutory Instruments 32 – the Custom and Excise Act – and 33 – the Value-Added Tax Act – enacted in 2008 relating to energy-saving appliances, machinery and equipment.</p>	<p>Those zero-rated include solar panels and batteries, and non-electric solar water heaters (solar geysers). Imports will still be subject to customs duties. This should stimulate business growth in the SAS sector by lowering the cost of importing goods into the country.</p>

4.3 E-waste Regulation

The Zambian Bureau of Standards (ZABS) and Zambia Information and Communications Technology Authority (ZICTA) are leading the adoption of e-waste standards. There are 11 proposed standards, four of which have been adopted. These will guide companies, including those in the SAS sector, on how to minimise the environmental impacts of disposing their products as well as provide guidelines for recycling.

4.4 Financial and Mobile Payment Regulation

The ICT sector is regulated by ZICTA. The National Payment Systems Directives on Electronic Money Issuance (2015) covers licensing procedures, minimum capital, use of agents, consumer protection and Know-Your-Customer requirements, with an aim to protecting both investors and consumers.

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41.

42. USAID (2020). *Zambia energy sector overview*.

Mobile money uptake almost doubled between 2017 and the end of 2018, as did the number of mobile money agents.

However, much of this growth was due to opening of mobile wallets by new SIM card holders. In practice, mobile usage rates remain low. The opportunities for increased uptake remain significant – particularly if active usage can be encouraged among clients with mobile wallets automatically opened with the acquisition of SIM cards.⁴³

4.5 Gender and Social Inclusion Mainstreaming Regulation

The National Energy Policy (2019) recommended collection of gender statistics and sex-disaggregated data, and a more gender inclusive approach to coordinating renewable energy issues. Gender equality is noted in Vision 2030, Seventh National Development Plan (7NDP), National Gender Policy (2014) and the Gender Equity and Equality Act (2015). A Gender Strategy and Action Plan for the energy sector is under development with support from the European Union (EU).



Brian Chitundu, an agent for Fenix/Readypay, shows Ms. Joyex Zulu how to use her HomeStarter solar kit.
Photo courtesy: www.bgfz.org

43.

5. FINANCING

5.1 Supply Chain Financing

COVID-19 has negatively impacted the banking sector. According to the Bank of Zambia (BoZ), as at August 2020, the interest rate was 8 per cent, higher than the 6 to 8 per cent medium term target.⁴⁴

Many SAS companies in Zambia still look to international investors whose capital requirements and foreign currency financing result in high borrowing rates, often over short periods of two to three years. The reason for this is that many local lending institutions are still not very conversant with the renewable energy market and hesitant to lend to it.⁴⁵ These terms are unfavourable and inflexible for local SAS companies considering the time taken to order, receive and sell product and collect payment (particularly on PAYG). There is also the challenge of currency risks as financing is often in foreign currency. The impact of COVID-19 has worsened the outlook on the Zambian Kwacha, which saw its value depreciate 31.5 per cent between March 1 and September 19, 2020.⁴⁶

Despite the largely negative impacts of COVID-19 on the financial sector, various innovative instruments have developed to ease its impact on SMEs. The most notable funds raised in response to COVID-19 are through the support of the World Bank (USD2.5 million). BoZ has created a Medium-Term Refinancing Facility through which financial service providers (FSPs) will access funds for onward-lending to businesses (including renewable energy players). BoZ introduced the ZMW10 billion (USD550 million) COVID-19 fund specifically for financial institutions to lend to micro, small and medium enterprises (MSMEs) at a concessional rate expected to be significantly lower than the current (Development Bank of Zambia) rate of under 12.5 per cent.⁴⁷ The Development Bank of Zambia will leverage this fund to lend specifically to MSMEs in the renewable energy sector.

Other funding available to the Zambian SAS sector is noted in Table 5.

Table 5: Available financing for SAS⁴⁸

Financier	Type	Investments/available funding
Bank of Zambia	Loan/credit guarantee	USD30 billion ⁴⁹
Bank of China	Debt	USD130 million
German Development Bank (KfW)	Debt	USD191 million
Beyond the Grid Fund for Zambia (BGFZ)	Debt	Up to GBP17.5 million (USD23.3 million)
African Development Bank	Debt	USD58 million
Electrifi	Debt	USD40 million
Infraco Africa	Grant	USD171 million

45. Interview with ZOGTF member in January 2021.

47. Interview with Project Manager, Electricity Services Access Program (Development Bank of Zambia) in December 2020.

48. This list is not exhaustive.

5.2 Consumer Financing

According to a FinScope Zambia Survey, the country has attained 69.4 per cent financial inclusion.⁵⁰ Limitations for consumer SAS product access are largely driven by SAS businesses' difficulties in accessing start-up and scale-up capital, which in turn limits their capacity to deliver to remote, rural parts of the country. The prevalence of mobile services and growing use of mobile money might help to support consumer financing.

Microfinance Institutions (MFIs)

There are 35 licensed MFIs in Zambia, 10 of which are solely focused on loans. Seven of them are members of the Association of Microfinance Institutions of Zambia (AMIZ). While there is an estimated USD70 million (annual) MFI lending in Zambia, the main challenge is that MFI interest rates can be as high as 187.5 per cent annually.⁵¹ To date, none of the Zambian MFIs are lending specifically for SAS. Some of the MFIs in the country include FINCA, FSD Zambia, AGORA, Jumo and Microloan Foundation (female-led).

Mobile money networks

There are three main mobile money operators in Zambia – MTN, Airtel and Zamtel. The country's mobile penetration stands at 104.1 per 100 inhabitants.⁵² Plans

to extend coverage to remote parts of the country are underway through Africa Mobile Network (AMN) using solar-powered base stations. To offer SAS consumers a more holistic service and overcome low mobile agent distribution numbers in rural areas, MTN partnered with Fenix International to expand solar and alternative energy products across the country, including using PAYG, such that Fenix traders were also trained as mobile money agents. This business model may be a solution to last-mile distribution challenges that hinder SAS adoption and financial inclusion. Zambia was an early adopter of digital financial services (DFS) in Africa and the country has seen exponential growth in mobile money transactions, which have increased from ZMW18.9 billion (USD1.04 billion) in the first half of 2019 to ZMW43 billion (USD2.4 billion) in the first half of 2020 (126 per cent increase).⁵³

Remittances

Diaspora remittances remain a largely informal process. There has been some work to use remittance funds to pay for SAS products, for example BBOX's partnership with Shell Foundation in Rwanda.⁵⁴ Through this, Zambian foreign workers would have the opportunity to directly send funds to a SAS company toward the purchase of products, but there is no evidence yet of a cross-border product/service that makes this possible.



Limitations for consumer SAS product access are largely driven by SAS businesses' difficulties in accessing start-up and scale-up capital, which in turn limits their capacity to deliver to remote, rural parts of the country.



To offer SAS consumers a more holistic service and overcome low mobile agent distribution numbers in rural areas, MTN partnered with Fenix International to expand solar and alternative energy products across the country, including using PAYG, such that Fenix traders were also trained as mobile money agents.

50. FinMark Trust (2020). *Finscope 2020 survey: Topline findings*.

51. Lisulo, S. (2019). *Chibuyu Finance remains most expensive lender*.

52. ZICTA (2020). *Operators' statistics*.

54. *Interview with Acting Principal Energy Officer (MoE) in December 2020*.

6. MARKET SUPPORT

6.1 Development Partners

There are a number of development partners who are supporting the SAS sector in Zambia. The key ones are shown in the table below:

Table 6: Development partners in the SAS sector

Development partner: programme	Type of assistance	Objective/target
African Development Bank (AfDB)	Technical assistance	Supports the Zambian government in its efforts to catalyse private investment in small-scale renewable energy projects and thereby accelerate the achievement of its electricity generation targets and the diversification of its energy mix. ⁵⁵
World Bank: Electricity Services Access Project (ESAP)	Loan	Has set up a pilot line of credit for renewable energy players to be managed by the Development Bank of Zambia and co-operating partners BoZ, REA and ZESCO. ⁵⁶
Efficiency for Access Coalition	Grants and prizes	To promote high performing appliances that enable access to clean energy for the world's poorest people.
Solar E-Waste Challenge Supported by USAID (USD1.2 million)	Grant	Provide grant funding to companies with innovative approaches to solar e-waste management in sub-Saharan Africa.
World Bank: Scaling Solar (USD39 million) ⁵⁷	Loan	Offers a line of credit to SAS companies.
Swedish International Development Cooperation Agency (SIDA)/USAID: BGFZ (EUR20 million)	Grant	Supports private sector businesses to scale to rural and peri-urban areas. Has established around 148,000 off-grid connections so far, mainly through SHS with connection sizes between 5 to 50W (Tier 1 & 2). Despite its progress, programmes are needed that are more suitable for productive users of energy. ⁵⁸
German Corporation for International Cooperation (GIZ): Get.Invest ⁵⁹	Advisory services	Enable access to finance; provide market insights; support industry associations; and help regulators implement regulatory processes for private investments.
Foreign, Commonwealth and Development Office (FCDO): ACE TAF (2016– 22) ⁶⁰ (GBP15.5 million /USD21.7 million)	Technical assistance	Enable enterprise finance; test innovative approaches to stimulate private sector investment and market development.
USAID Southern Africa Energy Program (SAEP): Power Africa ⁶¹	Policy support and credit guarantee	<ul style="list-style-type: none"> • Support SHS companies with sales training to increase SHS sales and connections. • Assistance to ERB to set tariffs and allow conditional adjustments in tariff changes to be factored into the utility. • Support ZESCO to build systems and capacity for integration of intermittent renewable energy sources (e.g. solar and wind). • Support MoE and the regulator on the development of Renewable Energy Feed-In-Tariff (REFIT).

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57. ACE-TAF (2020). *Coordination in Africa's off-grid sector is accelerating progress towards universal energy access.*

58.

59. GetInvest (2019). *Zambia: Solar PV and hydro mini-grids: Model business case.*

60. ACE-TAF (2020). *Coordination in Africa's off-grid sector is accelerating progress towards universal energy access.*

61. USAID (2020). *Zambia energy sector overview.*

6.2 Training Institutions, Incubators, Accelerators

Pumulani Renewable Energy Centre: Provides hands-on and tailor-made courses for technicians and entrepreneurs through direct linkage with the private sector and by using trainers with full experience in production, installation and maintenance of solar products.⁶²

University of Zambia: Energy and Environment Research Group (EERG) in the department of physics focuses on consultancy, capacity building and research in the energy and environment space.

Kafue Gorge Regional Training Centre: Implementing a pilot project for skills development for the renewable energy and energy efficiency sub-sectors in Zambia with

funding from SIDA. The programmes will be Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA) accredited.⁶³

6.3 Market Data

There is ongoing data collection on the impact of COVID-19 particularly on SAS distributors and consumers. Recent publications covering the SAS market in Zambia include:

- CLASP (2020). Off-Grid Solar Social Enterprises Respond to COVID-19 in Kenya and Zambia.
- ACE (2020). Covid Response: Energy Ministries and the Off-Grid Sector.
- USAID (2021). Power Africa COVID-19 Response and Recovery.



Photo courtesy: www.lightingafrica.org

62.

63.



ACE TAF PARTNERS INCLUDE:



STRATEGIC PARTNER:



Tetra Tech International Development

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PO Box 19084 – 00100 | Nairobi, Kenya.