

# Stand Alone Solar (SAS)

## MARKET UPDATE

Kenya

March 2021



**Africa Clean Energy**  
Catalysing Africa's Solar Markets



**TETRA TECH**  
International Development





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## **Foreign, Commonwealth and Development Office (FCDO) Africa Clean Energy Technical Assistance Facility**

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### **Tetra Tech International Development**

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The Kenya 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.

The Africa Clean Energy (ACE) Technical Assistance Facility (TAF) is a 4-year programme aiming to catalyse a market-based approach for private sector delivery of renewable energy electrification technologies, with a focus on high-quality stand-alone solar (SAS) systems. Funded by the UK Government through the Foreign, Commonwealth and Development Office (FCDO), and implemented by Tetra Tech International Development,

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# CONTENTS

<b>Abbreviations and Acronyms</b>	<b>v</b>
<b>Executive Summary</b>	<b>vi</b>
<b>1 National Overview</b>	<b>1</b>
1.1 Current Context	1
1.2 Energy Access	2
<b>2 Demand-Side: Consumer Insights</b>	<b>3</b>
2.1 Potential Market	3
2.2 Ability and Willingness to Pay	3
2.3 Impact of COVID-19	3
2.4 Consumer Awareness of SAS	3
<b>3 Supply-Side: Stand-Alone Solar Companies</b>	<b>4</b>
3.1 Pico-solar and Solar Home Systems	4
3.2 Productive Use Systems	6
3.3 Importation and Local Manufacture	7
3.4 Kenya Renewable Energy Association	7
<b>4 Political Framework</b>	<b>8</b>
4.1 Government Institutions	8
4.2 Policy and Regulatory Environment	9
4.3 E-Waste	12
4.4 Financial and Mobile Payment Regulation	12
4.5 Gender and Social Inclusion Mainstreaming	13
<b>5 Financing</b>	<b>14</b>
5.1 Supply Chain Financing	14
5.2 Consumer Financing	14
<b>6 Market Support</b>	<b>18</b>
6.1 Development Partners	18
6.2 Training Institutions, Incubators, Accelerators	19
6.3 Market Data	20



## LIST OF TABLES

Table 1: Energy access	2
Table 2: Main suppliers of pico-solar and SHS	5
Table 3: Some of the active companies in solar PUE	7
Table 4: Current SAS institutional framework	9
Table 5: Recent policy and regulatory interventions in the SAS Sector	10
Table 6: Banks and other investors in the SAS sector	14
Table 7: Some of the MFIs involved in the SAS sector	16
Table 8: List of active donor organisations in the SAS sector	18

## LIST OF FIGURES

Figure 1: Kenya at a glance	viii
Figure 2: Certified SAS sales	4



## ABBREVIATIONS AND ACRONYMS

Acronym	Definition
AfBD	African Development Bank
DB	Decibels
DST	Digital Service Tax
GOGLA	Global Off-Grid Lighting Association
EPRAE	Energy and Petroleum Regulatory Authority
EU	European Union
GDP	Gross Domestic Product
IPPs	Independent Power Producers
IRENA	International Renewable Energy Agency
KEREA	Kenya Renewable Energy Association
CBK	Central Bank of Kenya
KNBS	Kenya National Bureau of Statistics
KRA	Kenya Revenue Authority
KOSAP	Kenya Off-Grid Solar Access Project
KP	Kenya Power
KES	Kenya Shillings
KW	Kilowatt
MW	Megawatt
PAYG	Pay-As-You-Go
PV	Photovoltaic
PUE	Productive Use of Energy
REREC	Rural Electrification and Renewable Energy Corporation
SAS	Stand-Alone Solar
SEFA	Sustainable Energy Fund for Africa
SHS	Solar Home Systems
SMEs	Small and Medium Enterprises
USD	US Dollars
WB	World Bank
KNES	Kenya National Electrification Strategy
USAID	United States Agency for International Development

## EXECUTIVE SUMMARY

**K**enya is a leader in adoption of stand-alone solar (SAS) in Africa. The vibrant market has continued to attract private sector involvement and investment over the years.<sup>1</sup> But the country's economic growth has been greatly affected by the COVID-19 pandemic, causing a fall in household incomes and disrupting value chains. With an expected referendum in 2021 to amend the constitution, and the General Election coming in 2022, there may be disruption of the policy agenda.

**The country has one of the highest electricity access rates in the region (75 per cent),<sup>2</sup> and the government has set an ambitious target of achieving a 100 per cent universal electricity access by 2022.<sup>3</sup>** While this is commendable, much remains to be done as most of the unelectrified population lives far away from the national grid. Grid power is also expensive at KES24.6/kwh (USD0.23/kWh).<sup>4</sup> SAS provides a great opportunity to bridge the gap and enable the government achieve the desired target.

**The country will need at least 2.2 million solar home systems (SHS) to achieve universal access by 2022.** With the government-led Kenya Off-Grid Solar Access Project (KOSAP) programme expected to provide at least 250,000 SHS by 2023, there is a big potential for the private sector and other players to participate. The pay-as-you-go (PAYG) model also provides another option to help attain the target in a country where mobile penetration is over 90 per cent and at least 95 per cent of households have access to one of the available mobile payment platforms.<sup>6</sup>

**In the wake of Covid-19, the government announced various measures to shield consumers and companies operating in Kenya from economic hardship.** This included tax cuts, reduced mobile transaction costs and an economic stimulus package. However, these came to an end in January 2021 although the pandemic persists. The country has entered into recession with over two million people sliding into poverty.<sup>6</sup> This will likely have an impact on the SAS sector due to late payments and disrupted supply chains. The number of borrowers blacklisted by licensed credit reference bureaus increased by 45 per cent to reach 14 million in January 2021.<sup>7</sup>

**There is high consumer awareness of SAS in Kenya, with at least 90 per cent of Kenyans having seen one and majority associating the products with cost-saving potential.<sup>8</sup>** Increased consumer confidence continues to drive the market, with over 372,000 appliances sold on cash basis and around 498,000 through PAYG in the first half of 2020.<sup>9</sup> The productive use of energy in the solar sector is in its infancy, with new frontiers being explored in water pumping, irrigation, health and cold storage.

There is still very low local production and manufacture of SAS products, with majority of the sector players preferring to import the appliances.

**The renewable energy sector is currently receiving a lot of attention from both policy and legal perspectives.** The gazettelement of the Energy Act, 2019 is seen as a game-changer. It increases the focus on renewable energy in the country's energy



The country has one of the highest electricity access rates in the region (75%), and the government has set an ambitious target of achieving a 100 per cent universal electricity access by 2022. The country will need at least 2.2 million solar home systems (SHS) to achieve this.

2. World Bank (2019). *Kenya, Beyond Connections: Energy access diagnostic report based on the multi-tier framework*.

3. SE4All (2020) *Achieving Universal Energy Access*.

8. CLASP (2020). *Consumer awareness campaign to promote off-grid solar in Kenya*.



mix and clearly highlights the functions of the national and county governments when it comes to renewables. The Act mandates the preparation of an integrated national energy plan that takes into account all the counties' energy plans. This will identify gaps and opportunities that will spur SAS sector growth.

**New regulations that are expected to positively impact the market are under development while some have already been passed.** A new Kenya Standard has also been gazetted and covers the new and bigger SAS systems. Extended Producer Responsibility (EPR) Regulations 2020 and e-waste regulations, while being useful to the country, are likely to increase the business costs, which will be passed on to the consumers, thus increasing the costs of SAS products.



*A home in Kenya, lit up by a solar panel system, sold by M-KOPA. Photo courtesy: [www.fortune.com](http://www.fortune.com)*

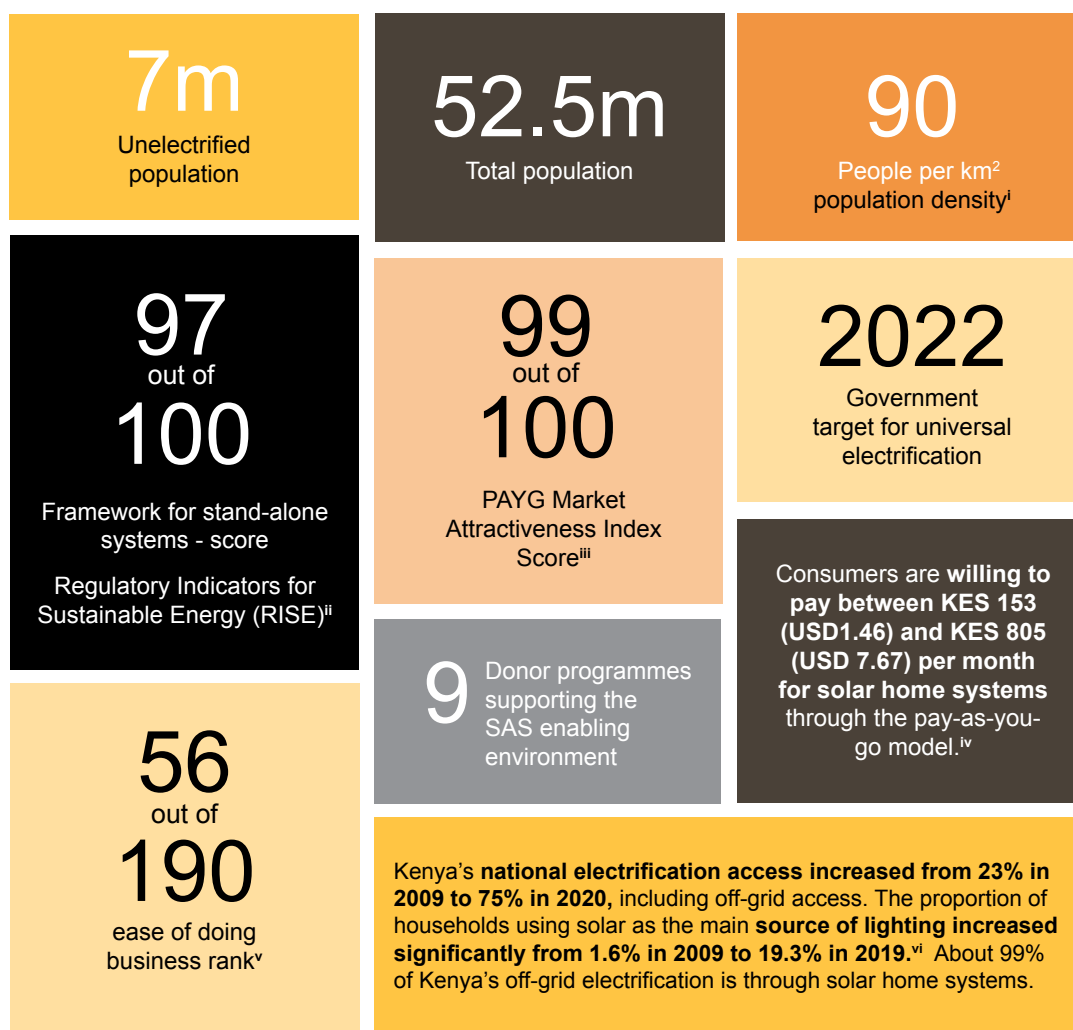


Figure 1: Kenya at a glance

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. IFC (2018) PAYG Market Attractiveness Index

v. World Bank (2018) Population data

vi. Economy Survey, 2020



# 1. NATIONAL OVERVIEW

## 1.1 Current Context

Kenya is the largest economy in the East African region, with a Gross Domestic Product (GDP) of KES10 trillion<sup>10</sup> (USD9.12 billion). The country slid into a recession in the third quarter of 2020 as measures introduced to stop the spread of COVID-19 continued to hurt the economy, with GDP growth falling to 1.1 per cent in 2020 from 5.5 per cent in 2019.<sup>11</sup>

The 2019 National Census revealed that Kenya's population increased to 47.6 million in 2019 from 37.7 million in 2009. There are about 12.1 million households, with an average household size of 3.9.<sup>12</sup>

In the World Bank's 2020 Ease of Doing Business ranking, the country improved to position 56 up from 61 in the previous year.<sup>13</sup> The government is implementing Vision 2030, a development plan, which is now in the Third Medium Plan for 2018–2022 and focuses on the Big Four Agenda: universal healthcare, affordable housing, food security and manufacturing. The agenda's success depends on adequate, affordable, and reliable energy.<sup>14</sup>

The COVID-19 pandemic has led to loss of trade and tourism resulting in subdued capital flows and tight financial conditions. In a study on the economic impact of the COVID-19 pandemic on East African economies,<sup>15</sup> a marked reduction in household and business spending (by about 50 per cent) due to liquidity constraints was noted. Revenue from tourism, which is a key forex earner, reduced by more than 20 per cent due to travel restrictions. There was also a reduction in government spending in different sectors due to a KES69 billion (USD629.27 million) shortfall in revenue collection in the 2019/20 fiscal year. External debt currently stands at KES7.1 trillion (USD64.8 billion). As a result of decreasing revenues, the government is

planning to borrow up to KES1 trillion (USD9.12 billion) in order to meet the 2020/21 budget demands.<sup>16</sup>

The Kenya shilling has also depreciated by almost 10 per cent (from KES100 to the USD earlier in 2020 to KES110 as at December 2020), notable the inflation rate increased from 5.2 per cent in 2019 to 5.3 per cent in 2020. The country's Consumer Price Index (CPI) increased from 100 points in February 2019 to 111.87 in December 2020.<sup>17</sup>

In March and April 2020, the government issued COVID-19 regulations including restricted night travel, restricted movement in four counties including Nairobi and Mombasa, cessation of international air travel and temporary closure of international borders.<sup>18</sup> Before the end of 2020, the intra-county travel and international travel restrictions had been lifted. However, stand-alone solar (SAS) companies in Kenya were categorised as essential service providers during the COVID-19 lockdowns and provisions were made for them to continue with certain operations during the curfew times. This limited negative impacts and avoided a complete shutdown of the sector. It is important to note that this designation was not effective right from the beginning of the lockdowns.

In 2019, a new Energy Act was passed, replacing the previous Act of 2006. The new Act aligns with the 2010 Constitution and specifies the roles and functions of both national and county governments in the energy sector. It places a lot of focus on renewable energy resource development in the country. In 2020, VAT was reintroduced on solar products, including batteries.<sup>19</sup> In June 2020, the East African Community Customs Management Act was amended to include import duty tariffs on solar accessories and spare parts.<sup>20</sup> These changes are expected to drive up the costs of SAS products.

10. KNBS (2020) *Economic Survey, 2020*.

12. 2019 Kenya population and housing census.

13. World Bank (2020). *Ease of Doing Business 2020*.

15. Deloitte (2020). *Economic impact of the COVID-19 pandemic on East African economies*.

18. Africanews (2020). *Kenya coronavirus: Updates from March–April 2020*.

The general elections are expected in 2022. However, there is a drive to change the constitution through the Building Bridges Initiative (BBI), which may culminate in a national referendum before end of 2021. This has heightened political activities, which may further slow the policy reform agenda and ultimately impact economic development.<sup>21</sup>

## 1.2 Energy Access

Kenya has one of the highest electricity access rates in the region currently at 75 per cent.<sup>22</sup> The country had the fastest rate of electrification in Africa in 2019<sup>23</sup> and the government has set a target of achieving 100 per cent universal electricity access by 2022. This will be earlier than the Sustainable Energy for All (SEforALL) goal of universal access by 2030.<sup>24</sup>

Nationwide data for 2019/20 indicates that the proportion of conventional households using mains electricity as the main source of lighting stood at 50.4 per cent in 2019. On the other hand, the proportion of conventional households using solar as the main source of lighting increased significantly from 1.6 per cent in 2009 to 19.3 per cent in 2019.<sup>25</sup>

Extension of the national grid is costly, coupled with the high cost of grid power which averages KES24.6/kwh (USD0.23/kWh), grid access is not a feasible solution for remote rural areas. According to the Kenya National Electrification Strategy (KNES),<sup>26</sup> about 1.1 million households that will need to be electrified are 15 kilometres or further from the main grid and are best served by off-grid energy. Therefore, off-grid solutions provide a viable avenue to achieving the targeted access rate.

The World Bank is supporting the Kenyan government through the Kenya Off-grid Solar Access Project (KOSAP), with an equivalent of USD 42 million (KES 4.41 billion) to increase energy access through SHS. This funding has two components; USD 30 million (KES 3.15 billion) and USD 12 million (KES 1.26 billion) as Solar Debt Facility and Result Based Financing respectively. The target is to deploy 250,000 SHS to reach 1.1 million people living in the underserved areas of Northern Kenya.<sup>27</sup>

**Table 1: Energy access**

<b>Electricity access (%)</b>	75% (53.5% on-grid, 23.5% off-grid) <sup>28</sup>
<b>Population without electricity access</b>	7.14 million <sup>29</sup>
<b>Grid tariff per kWh</b>	KES24.6/kwh (USD0.23/kWh) <sup>30</sup>
<b>Average per capita kWh usage</b>	180kWh

22. World Bank (2019). Kenya, *Beyond Connections: Energy access diagnostic report based on the multi-tier framework*.

24. SE4All (2020) *Achieving Universal Energy Access*.

25. KNBS (2020). *Economic Survey 2020*.

28. World Bank (2019). Kenya *Beyond Connections: Energy access diagnostic report based on the Multi-Tier Framework*.

29. World Bank (2019). *Data*

## 2. DEMAND-SIDE: CONSUMER INSIGHTS

### 2.1 Potential Market

According to the KNES, the estimated market opportunity for SAS is 2.2 million solar home systems (SHS) for the country to achieve universal access by 2022.<sup>31</sup>

The KOSAP programme targets the arid northern areas of Kenya, which have a lower penetration of off-grid solar than the Kenyan average. These areas represent 72 per cent of the country's total land area and 20 per cent of the total population but have a 70 per cent poverty level and only 7 per cent electricity access. There are about 1.3 million unelectrified households in the area. The programme will provide 250,000 SHS by 2023.<sup>32</sup>

### 2.2 Ability and Willingness to Pay

On average, Kenyans spend about 5 per cent of their income on electricity.<sup>33</sup> According to a Power Africa report, it is estimated that customers in the KOSAP territories can afford to pay between USD1.46 (KES160) and USD 7.67 (KES841) per month.<sup>34</sup>

In Africa, Kenya has the highest demand-side pillar score in the Pay-As-You-Go (PAYG) Market Attractiveness Index. The demand pillar consists of market size, ability to pay and willingness to pay parameters. Customers are prepared to pay for high quality energy provided by SHS through a PAYG system.<sup>35</sup> Affordable financing schemes where gradual payments are arranged have contributed to increased adoption of SHS products.

### 2.3 Impact of COVID-19

The first case of COVID-19 in Kenya was reported on March 13, 2020. As at February 1, 2021, there were slightly over 100,000 cases and 1,750 fatalities in the country.<sup>36</sup> Following the outbreak of the pandemic, demand and supply shocks hit all sectors of the economy. The pandemic has reversed gains in poverty reduction

in Kenya with reduced business activity impacting on households' income. In addition, there have been fewer job opportunities with the unemployment rate being twice what it was pre-COVID-19.<sup>37</sup> The economic and social disruption caused by COVID-19 has resulted in over two million more Kenyans sliding into poverty.<sup>38</sup>

From the 60 Decibels Vulnerability Index, over 89 per cent of SAS clients indicated that their financial situation had become worse and for about 51 per cent, it had gotten "much worse" during the pandemic. About 13 per cent reduced their loan payments as a coping mechanism.<sup>39</sup> Loan repayments have become a burden for 49 per cent of the OGS clients due to the pandemic's impact. Small and medium enterprises (SMEs), which are the lifeline of Kenya's economy, have been struggling to remain afloat.<sup>40</sup>

Licensed Credit Reference Bureaus (CRBs) in Kenya have reported that the number of borrowers that have been blacklisted increased by 45 per cent from August 2020 to reach 14 million in January 2021.<sup>41</sup> The Central Bank of Kenya (CBK) reported that non-performing loans hit KES381 billion (USD3.5 billion) in the year ended June 2020, which is a 13.7 per cent increase compared to 2019.

### 2.4 Consumer Awareness of SAS

There is high consumer awareness of SAS in Kenya, with over 90 per cent of citizens having seen one. This has been driven by government-led end-user promotion, community awareness programmes, media advertisements and demonstrations.<sup>42</sup> About 50 per cent have owned a solar product for mobile charging, lighting or related application. Non-governmental organisations (NGOs) have also played a big role in promotion of productive use of solar energy like water pumping. Over 90 per cent of Kenyans regard cost saving potential as the driving force for preference of solar photovoltaic (PV) systems to other technologies.<sup>43</sup>

33. USAID (2019). *Off-grid solar market assessment brief for 14 underserved counties of Kenya 2020*.

37. World Bank (2020). *Annual reports*.

39. 60 Decibels (2020). *Financial well-being in the face of COVID-19*.

42. CLASP (2020). *Consumer awareness campaign to promote off-grid solar in Kenya*.

43. Kenya Climate Innovation Centre (2018). *Kenya solar PV market assessment*.

### 3. SUPPLY-SIDE: STAND-ALONE SOLAR COMPANIES

#### 3.1 Pico-solar and Solar Home Systems (SHS)

Although pico sales constitute a large share of the off-grid market sales, consumer confidence has considerably increased since 2016 and more consumers have subsequently adopted large plug and play systems. Spurred by this trend, companies have continuously introduced larger systems into their portfolios while dealers continue to push their customers

to upgrade to larger systems. Demand for systems able to power televisions has increased, leading to continuous growth in sales. Around 372,000 appliances have been sold on cash basis and around 498,000 through the PAYG system in the first half of 2020.<sup>44</sup> Figure 1 highlights the performance of the sector since 2016.

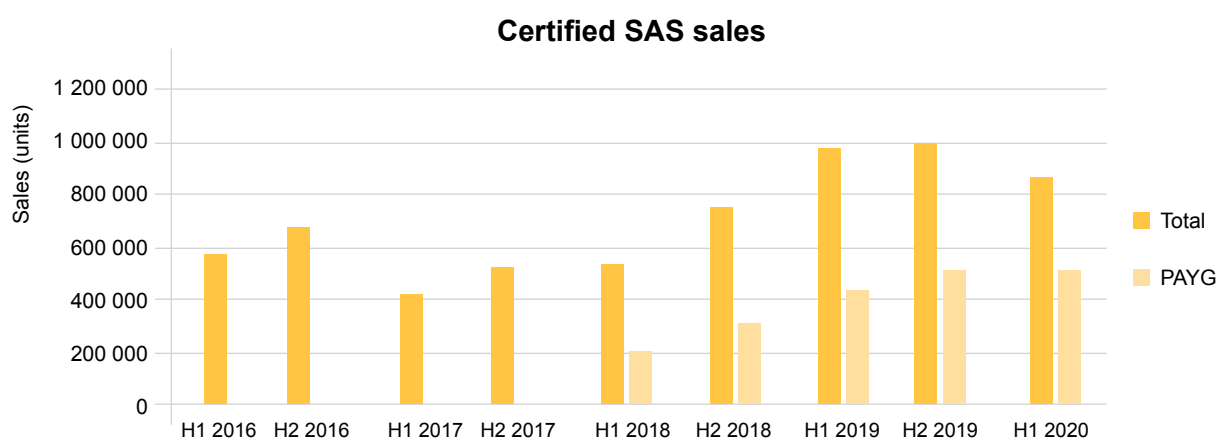


Figure 2: Certified SAS sales (Source: GOGLA)

Cash sales for the first half of 2020 decreased by 25 per cent as compared to the second half of 2019 and by 31 per cent as compared to the first half of the same year. Hypothetically, this may be attributed to the restrictions imposed due to the COVID-19 pandemic. The purchasing power and disposable income of customers has considerably declined due to job losses and decreasing income as a result of low business activity.

In East Africa, Kenya is the market leader of SAS. This is mostly credited to an enabling regulatory environment and the expansion of PAYG and other consumer financing mechanisms.<sup>45</sup> Other contributing factors

include high costs of grid electricity, lack of access to electricity and innovative payment models driven by high mobile money penetration.

There are about 50 companies in Kenya's off-grid solar ecosystem. Before the COVID-19 pandemic, the market had witnessed the entrance of a number of new players including BBOXX, Deevabits Green Energy and Spark Possibilities. A large portion of the players are small enterprises with 75 per cent of companies having an annual turnover of less than USD1 million, and 15 per cent having an annual turnover of between USD10 million to USD25 million.<sup>46</sup>

45. GOGLA (2019). H2 global off-grid solar market report: Semi-annual sales and impact data.

In the last two years, use of solar lamps in fishing activities has increased driven by the high cost of paraffin. In addition to being cheaper, the solar lamps, compared to paraffin lamps, are safer, reduce fish contamination and do not have paraffin spillage. Due to growing popularity of solar lamps among the fishermen around Lake Victoria, companies dealing in solar related products have reported increased business.<sup>47</sup>

The pandemic interrupted supply chains due to delayed shipments and restricted international travel. This

impacted business operations and product stocking.<sup>48</sup> During the lockdown, some SAS dealers noted reduced demand for products compared to previous years.<sup>49</sup>

Restrictions also slightly increased the cost of doing business during this period, including acquisition of travel permits, installation of washing points at shop outlets and reduced outlet operating hours.

The following table lists some of the major suppliers and new entrants in the SAS sector in Kenya.

**Table 2: Main suppliers of pico-solar and SHS**

Company	Business model	Brand/product focus
d.light	Cash/PAYG	Partnered with Solar Frontier Capital to create Brighter Life Kenya 1 Limited, a financing vehicle targeting d.light's PAYG accounts. <sup>50</sup> Collaborated with Shell to offset consumers' payments for July 2020. <sup>51</sup> Opened a national call centre in Nairobi manned by over 700 customer care personnel for quick response.
Azuri Technologies	PAYG	Partnered with major satellite TV channels in 2020 to provide satellite TV content to off-grid households. <sup>52</sup>
Kenital Solar	Cash	Sales/installations of SAS.
Barefoot Power	Retail	Is partnering with the European Union (EU) to implement Women Increasing Sustainable Energy Access and Use (WISE) programme. Had a change of ownership in 2019.
BBOX	PAYG	Has major repair centre in Nairobi for product servicing. <sup>53</sup> EDF (France) acquired a 23% stake in Bboxx's Kenya operations.
Total Kenya	Cash	One of the leading petroleum and gas retailers. It utilises its wide network of service stations as points of sale for Total Solar lamps. <sup>54</sup>
BioLite	PAYG	Partnered with Angaza for the PAYG platform.
Givewatts	Credit	An NGO with donor support to provide solar lanterns to households and schools.
Greenlight Planet	PAYG	Secured USD90 million in new funding to expand its PAYG solar consumer financing business. <sup>55</sup>

48. Lean Energy Solutions.

49. Interview with M-Kopa staff member.

55. Funding from European development finance institutions CDC Group, FMO and Norfund.

**Table 2: Main suppliers of pico-solar and SHS (Continued)**

Company	Business model	Brand/product focus
M-KOPA Solar Kenya	PAYG/cash	Started local solar TV assembling in 2019. <sup>56</sup>
Solinc East Africa	Cash	Local manufacturer of solar panels in Kenya and region. Also partnering with M-KOPA, Mobisol and Solar Panda to reduce e-waste by refurbishing used products for recycling. <sup>57</sup>
Engie Mobisol	PAYG	Engie acquired Mobisol in October 2019. <sup>58</sup>
Fosera	Cash/PAYG	Partnered with Angaza for the PAYG platform. <sup>59</sup>
Deevabits Green Energy	PAYG	A new entrant using a village solar entrepreneurs (VSE) approach to distribute solar products. <sup>60</sup> Obtained a loan from SIMA Angaza Distributor Finance Fund. <sup>61</sup>
Solar Kiosk	Cash	Provides a range of services including solar product, e-hubbs, trading and business incubation. A finalist in the Zayed Sustainability Prize 2020. <sup>62</sup>
Solar Panda	PAYG	Got an additional syndicate lender (Facility for Energy Inclusion Off-Grid Energy Access Fund's – FEI OGEF) to supplement financing within a framework of a syndicated loan of KES1.57 billion (USD15 million). <sup>63</sup>
Spark Possibilities	PAYG/Cash	Also known as Sunspot Energy Inc. Recently entered the Kenyan SAS market.
Trend Solar	PAYG	Entry into Kenya market in 2019 targeting affordable access to smartphones and Internet connection to the rural population.
Omnivoltaic	PAYG/Cash	Returned to the Kenya Market in 2019 after a previous exit.

### 3.2 Productive Use Systems

There is growing interest in productive use of energy (PUE) applications of solar such as water pumping, irrigation, sterilization and cold storage. Over 3,000 solar pumps are sold in Kenya every year.<sup>64</sup> Solar pumping presents substantial PUE market with increased focus on agriculture to reduce poverty<sup>65</sup> and increased affordability of solar water pumps.<sup>66</sup> The National Water Master Plan 2030<sup>67</sup> has also proposed

several initiatives to increase irrigation in Kenya thus increasing the opportunity for solar pumping.

Off-grid solutions have allowed clinics to considerably reduce their use of other costly energy sources such as diesel, especially during the COVID-19 pandemic. Clinics are also able to store vaccines in solar powered fridges and remain open for longer. However, a key challenge is when there is no proper maintenance of the systems, and they remain unused long after installation.<sup>68</sup>

60. About Deevabits Green Energy.

61. Angaza (2020). SIMA Angaza Distributor Finance Fund announces first three investments.

62. Solar Kiosk (2020). Solar solutions for frontier markets.

64. Winrock International (2018). Scaling up smallholder solar irrigation in sub-Saharan Africa.

65. World Bank (2019). Kenya Economic Update

67. *ibid.*



In Kenya, about 40 to 50 per cent of food is lost or wasted along the value chain due to poor storage.<sup>69</sup> Solar-powered cold storage systems can mitigate this waste, ensuring food security and increased farmer's income.

Asobo, a new entrant in Kenya is promoting the use of electric engines for fishing boats instead of diesel engines in Lake Victoria. The electric engines are charged using solar thereby reducing fuel pollutants and emissions in the lake.<sup>70</sup>

**Table 3: Some of the active companies in solar PUE**

Company	Speciality
SunCulture	Recently introduced Rain Maker 2, which comes with installed Internet technology for remote monitoring and backup.
Future Pump	Distributes solar pump solutions that are ideal for small scale farmers with 1 or 2 acres of land.
Kickstart/Encap Technologies	The two have partnered to provide motors for affordable, solar-powered irrigation pumps.
Kickstart/Angaza Designs	The two partnered to incorporate PAYG in pumps.
Ecozen	Entered Kenya as Africa's entry point and has installed some cold units in the country. Also promoting solar water pumps.
Solar Freeze	Adopting solar powered mobile cold storage units in Kenya targeted at small-scale farmers to reduce post-harvest losses.
Asobo	Promoting electric boat engines charged using solar among fishermen around Lake Victoria

### 3.3 Importation and Local Manufacture

There is limited local manufacturing of solar components in Kenya – over 90 per cent of panels in use in the country are imported from China.<sup>71</sup> Solinc East Africa is a local solar panel manufacturer, with M-KOPA being a major client.<sup>72</sup>

Ledmatix has established an LED lamps manufacturing plant in Nairobi.<sup>73</sup> In 2019, M-KOPA started a solar TV assembly plant in Kenya. However, the business has not picked up as expected due to the COVID-19 pandemic.<sup>74</sup>

### 3.4 Kenya Renewable Energy Association (KERA)

KERA is an independent non-profit association formed in August 2002 to facilitate development of the renewable energy business in Kenya.<sup>75</sup> It currently has about 90

members – both corporate and individuals. It has two regular salaried staff members. The organisation is now recruiting a Chief Executive Officer to enhance its operations. Some of KERA's achievements include:<sup>76</sup>

- ♦ Advocacy on behalf of SAS companies against the Tax Amendment Bill 2020 that proposed removal of tax exemptions on solar products.
- ♦ Lobbying for members interests during the development of the Solar PV and Water Heating Regulations 2020 and the Energy Act 2019.
- ♦ Organisation of the East Africa Renewable Federation workshop in 2020.
- ♦ Lobbying for member companies to access restricted counties and operate beyond the COVID-related curfew hours.

KERA is a member of the Kenya Private Sector Association (KEPSA). Some SAS companies are not KERA members but belong to the African Mini-Grid Developers Association (AMDA) which also has a chapter office in Kenya.

73. Consultant visit.

74. Interview with M-KOPA staff member.

76. Interview with KERA representative.

## 4. POLITICAL FRAMEWORK

### 4.1 Government Institutions

There has been renewed focus on renewable energy in Kenya's energy mix through the enactment of the Energy Act, 2019. The Act sets out new and distinct functions for the national and county governments to implement renewables, and created the

new Energy and Petroleum Regulatory Agency (EPRA) and Rural Electrification and Renewable Energy Corporation (REREC). Table 4 provides a snapshot of recent activity in the institutional environment.

**Table 4: Current SAS institutional framework**

Company	Brand/product focus
National government	As per the Energy Act 2019, functions include national policy formulation, energy regulation and licensing and operation and development of energy infrastructure,
County governments	<ul style="list-style-type: none"> <li>Developing renewable energy policies and master plans, including resource mapping.</li> <li>Responsible for county energy regulation, thus will play a role in SAS deployment.</li> <li>Technical committee on energy and infrastructure formed at the Council of Governors.<sup>77</sup></li> </ul>
Ministry of Energy	<ul style="list-style-type: none"> <li>Finalised and gazetted the new Energy Act, 2019 that repealed the Energy Act, 2006.</li> <li>Responsible for creation of a conducive environment to spur investments in the energy sector.</li> <li>Launched the National Energy Efficiency and Conservation Strategy in Sept 2020 that covers 5 sectors, one of them being households.</li> </ul>
Energy and Petroleum Regulatory Authority (EPRA)	<ul style="list-style-type: none"> <li>Responsible for regulating energy activities in Kenya as per the new Act.</li> <li>Organised stakeholder consultations on the new Solar Regulations in 2020.</li> <li>The board is considering new organization structure to comply with the Act.</li> <li>Currently has an acting DG awaiting appointment of a substantive one by the Board.</li> <li>EPRA has been lobbying for reversal of VAT exemption of SHS products.<sup>78</sup></li> </ul>
Rural Electrification and Renewable Energy Corporation (REREC)	<ul style="list-style-type: none"> <li>Replaced the Rural Electrification Authority (REA) under the new Act.</li> <li>New mandate includes research, promotion and deployment of renewable energy. It is thus responsible for enhancing uptake of renewable energy, especially SAS systems in off-grid locations.</li> <li>Has adopted new organisational structure to align with the new Act and is recruiting for new positions.</li> <li>Has been engaging the county governments for partnership in energy provision.</li> </ul>
Ministry of Finance	In 2020, the ministry re-introduced 14% VAT on solar equipment including batteries. <sup>79</sup> This increased to 16% in January 2021. Stakeholders feel this will curtail progress of SAS due to the incremental costs that have to be passed to consumers.

78. Interview with EPRA Renewable Energy Office.

**Table 4: Current SAS institutional framework (Continued)**

Company	Brand/product focus
Kenya Power	<ul style="list-style-type: none"> <li>The national utility has been advocating an increase in grid electricity charges by up to 20%<sup>80</sup> which is under consideration by EPRA.</li> <li>The company's financial performance has been declining over the last two years, further slowing grid expansion and maintenance.</li> <li>There have been several top management changes due to financial and procurement mismanagement.</li> </ul>
Kenya Bureau of Standards	In consultation with stakeholders, spearheaded development and adoption of the new standard KS IEC 62257 to replace the old KS 2542 standard. The new standard covers the plug-and-play systems and appliances with a peak power rating of 350Wp. It was gazetted in February 2021.
Kenya Revenue Authority (KRA)	Implemented new taxation regime that has an impact on the SAS sector.
East African Community (EAC)	<ul style="list-style-type: none"> <li>On June 30, 2020 the EAC Customs Management Act was amended to include import duty tariffs on solar accessories and spare parts.<sup>81</sup></li> <li>There was initial confusion on correct and consistent interpretation of the amendment.<sup>82</sup> and after consultation with customs and revenue authorities, it was clarified that PV modules, Direct Current Charge Controllers and inverter qualify for exemption</li> </ul>
Ministry of Environment and Forestry	<ul style="list-style-type: none"> <li>In May 2020, the ministry invited public submissions on draft regulations on Extended Producer Responsibility (EPR) within the country.</li> <li>The regulations are likely to be finalised and gazetted in 2021.</li> </ul>
National Environmental Management Authority (NEMA)	<ul style="list-style-type: none"> <li>Organised stakeholders' consultations on proposed E-Waste Management Strategy and Regulations.</li> <li>There is no indication when the regulations will be finalised and gazetted</li> </ul>

## 4.2 Policy and Regulatory Environment

With the gazettment of the new Energy Act 2019, there is increased focus on renewable energy by both national and county governments. The requirement for an integrated national energy plan and energy resources inventory map will assist to identify gaps and opportunities. The Act also imposes local content

requirements on energy projects.<sup>83</sup> Such a deliberate policy push is likely to promote SAS in the long term. The following table summarises recent policy and regulatory activities that have an impact on the SAS sector.

83. The Energy Act, 2019.

**Table 5: Recent policy and regulatory interventions in the SAS Sector**

Company	Brand/product focus	Comments
Energy Act, 2019	<ul style="list-style-type: none"> <li>Gazetted on March 14, 2019.</li> <li>Focus given to renewable energy resources mapping.</li> <li>Provides clear functions for national and county governments.</li> <li>Created REREC with mandate to spearhead renewable energy drive.</li> <li>Created the Renewable Energy Resources Advisory Committee (RERAC), which is in charge of overseeing the management, allocation, licensing and development of renewable energy sources.</li> <li>Allows net-metering concept capping at 1MW. This will encourage households and businesses to invest in own generation.</li> </ul>	<ul style="list-style-type: none"> <li>Clear roles and responsibilities are useful for renewable energy investors and those wishing to invest in Kenya.</li> <li>When renewable energy resource mapping is availed to potential investors, it will reduce assessment and feasibility costs.</li> <li>Likely to increase promotion and adoption of SAS to increase energy access.</li> <li>County governments are expected to roll out renewable energy plans but capacity challenges and lack of priorities hinders progress.</li> <li>KOSAP will increase energy access through SAS.</li> </ul>
The Energy (Solar Photovoltaic Systems) Regulations 2019. <sup>84</sup>	<ul style="list-style-type: none"> <li>They are a revision of the existing Energy (Solar Photovoltaic Systems) Regulations, 2012 within the provisions of the Energy Act, 2019.</li> <li>They provide a framework for enforcing standards in the importation, design and installation of solar PV systems; regulation of solar plug-and-play devices; certification and licensing fees for solar PV installers and contractors; and collection of energy data.</li> <li>Stakeholders' consultations done in 2020, now awaiting gazette.</li> </ul>	<ul style="list-style-type: none"> <li>Registration of imported SHS products may impose additional costs.</li> <li>Licensing of personnel and longer warranties will ensure higher quality of SAS supplied and installed hence more reliability and adoption.</li> </ul>
Finance Act 2020	<ul style="list-style-type: none"> <li>Moved solar batteries from zero rated to the standard rate of 14%. This increased to 16% VAT from January 2021 with the withdrawal of COVID-19 tax waivers.</li> <li>Introduced more taxes including a 1.5% digital service tax (DST)<sup>85</sup> and a 1% turnover tax on gross sales.<sup>86</sup></li> </ul>	<ul style="list-style-type: none"> <li>The import tariff increase coupled with the 16% VAT will slow the vibrant SAS sector in Kenya<sup>87</sup> due to increased cost to consumers.</li> <li>SAS companies are still not sure how the DST will affect their business as this depends on the interpretation.<sup>88</sup></li> <li>Business entities reporting tax losses due to investment incentives will incur the minimum tax. Some SAS firms may be affected.</li> </ul>

84. EPRA (2020). Licensing and regulations.

88. Interview with M-KOPA staff member.

**Table 5: Recent policy and regulatory interventions in the SAS Sector (Continued)**

Company	Brand/product focus	Comments
East African Community legislation	Amendments reintroduced up to 25% import duty on solar lanterns.	10%-25% import duty plus 16% VAT calculated on top imply a major new cost impact on solar lanterns, which could slow uptake due to high cost.
Standards Act, 2020	<ul style="list-style-type: none"> <li>New quality standard covering SAS developed by stakeholders through KEBS.</li> <li>The Act requires a certificate of conformity to Kenyan standards for imported products, approved specifications and other applicable regulations.</li> </ul>	Will ensure importation of quality SAS appliances.
Data Protection Bill, 2018 <sup>89</sup>	Intended to regulate the processing, transfer and protection of privacy in personal data.	Likely to affect SAS companies dealing with PAYG systems where customers' data is transferred to another country for processing or storage.
Companies (Beneficial Ownership Information) Regulations <sup>90</sup>	<ul style="list-style-type: none"> <li>Regulations require that every company operating in Kenya keep a register of its beneficial owners and submit a copy of the BO Register by July 31, 2021.</li> <li>Many companies have been reluctant to comply.</li> </ul>	Many of the SAS companies that are both locally and foreign owned have to disclose beneficial owners with more than 10% of the issued shares in the company either directly or indirectly.
Extended Producer Responsibility (EPR) Regulations, 2020 <sup>91</sup>	Regulations are targeted at product manufacturers to make them responsible for the entire product chain with focus on recycling and final disposal of the product.	The country will immensely benefit from better management and disposal of e-waste, but the cost is likely to be passed on to consumers.
E-waste Regulations	<ul style="list-style-type: none"> <li>Developed by NEMA and discussed by stakeholders.</li> <li>Official approval awaited before public dissemination.</li> <li>Provide a framework for handling e-waste in a sustainable manner.<sup>92</sup></li> </ul>	Disposal of electronic equipment e.g. batteries is now regulated.

### 4.3 E-waste

The SAS e-waste generated in Kenya amounts to 3 per cent of the total volume of e-waste generated.<sup>93</sup> The proposed E-Waste Management Regulations, which cover SAS products, address safe end-of-life treatment of electronics. One challenge in Kenya is lack of recycling service providers and lack of follow up mechanisms. The Waste Electrical and Electronic Equipment (WEEE) Centre, an e-waste recycling facility in Nairobi estimates that only 1 per cent of 44,000 tonnes of e-waste produced in Kenya is recycled.<sup>94</sup>

CDC Group, M-KOPA and sustainability firm Sofies undertook a survey of 500 M-KOPA customers between October 2019 and January 2020.<sup>95</sup> Findings indicated that a majority of respondents would not usually return e-waste to the seller. Instead, they keep the e-waste at home or use environmentally unfriendly solutions like burning, burying or just discarding the products. When approved, the regulations will have a cost bearing on the SAS companies.

In 2019, GOGLA organised a solar e-waste festival in Nairobi where participants also discussed Kenya's draft e-waste bill. More recently, GOGLA and KEREAA have collaborated to establish the Kenya Solar Waste Collective (KSWC), still in formative stages, expected to become a Producer Responsibility Organisation (PRO) in line with Kenya's draft Extended Producer Responsibility Regulations.

In one of the interviews for this country update, a representative from a leading company<sup>96</sup> stated that they have already established a mechanism to address the e-waste problem. The company has teamed up with EnviroServe to set up a system.

### 4.4 Financial and Mobile Payment Regulation

When the pandemic broke out, the government, banks and mobile money service providers agreed to waive digital money transfer fees and payment fees to discourage the use of cash as a COVID-19 control measure. The fees have since been reinstated, but, transfers between banks and to mobile money services remain free<sup>97</sup> although a majority of Kenyans do not have bank accounts.<sup>98</sup>

There is currently no regulatory oversight on digital borrowing platforms in Kenya, which neither fall under the Banking Act nor the Microfinance Act. There is a push for the Central Bank of Kenya (CBK) to supervise and regulate digital financial products and services.<sup>99</sup> The CBK (Amendment) Bill, 2020, intends to amend the CBK Act to give it oversight powers over digital financial products and services in Kenya.

This may necessitate SAS companies using PAYG platforms to seek CBK's approvals for the customers loan repayment plans if the Bill becomes law. In addition, many SAS customers who currently rely on numerous digital loan apps to settle their daily PAYG payments may have limited choices, thus increasing payment defaults that will have a negative cash flow impact on the providers.



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96. Interview with M-KOPA representative



## 4.5 Gender and Social Inclusion Mainstreaming

Kenya is above the African average score of 0.484 in the Africa Gender Index (AGI) with a score of 0.522 (1.0 is gender parity).<sup>100</sup> The government is working on the gender equity requirements of the Constitution.

In 2019, the Ministry of Energy launched a Gender Policy that promotes the participation of women and girls in energy value chains.<sup>101</sup> In the 2020/2021 budget, the ministry allocated budgetary support for gender activities, which include policy implementation actions like capacity building of staff.<sup>102</sup> However, the resources are still insufficient for full implementation of gender mainstreaming.

Government public procurement laws require that 30 per cent of public tenders be reserved for women, youth and the disabled. There are also various funds established to support women entrepreneurs including the Women's Enterprise Fund, Uwezo Fund and the National Government Affirmative Action Fund. This has created an opportunity to increase the number of women involved in renewable energy value chains.

The Equalisation Fund Bill 2019 targets the less developed counties, which also have the least access to energy. Although there is no specific reference to energy access, part of the equalisation funds could be utilised on power provision and SAS projects.<sup>103</sup>



*For two Kenyan farmers, solar lamps benefit every part of life  
Photo credit: Hailey Tucker 2014*

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100. AfDB (2017). Country gender note for Kenya in the context of the bank CSP 2014-2018.

## 5. FINANCING

### 5.1 Supply Chain Financing

**K**enya has been at the forefront of SAS adoption in Africa.<sup>104</sup> This can partly be attributed to the PAYG business model and early adoption of mobile money.

There has been remarkable interest from foreign based financiers, attracted by the mature SAS market in the country. The foreign investments are in form of grants, equity, debt and impact funds. In the past, local banks and microfinance institutions (MFIs) developed loan portfolios targeting solar products.<sup>105</sup> But there are few local investors willing to invest in the SAS sector due to the perceived risks of non-payment and focus on traditional business models.

Many of the local banks prefer the low risk government securities in contrast to lending to private sector.<sup>106</sup> This has contributed to liquidity challenges slowing down new local investment.<sup>107</sup> Thus few local companies have achieved substantial market share as compared to foreign based companies that are able to attract large investment inflows.<sup>108</sup> Leading company d.light has so far received total financing for the Kenyan business equivalent to KES13.9 billion (USD127 million) for working capital and growth.<sup>109</sup>

The government implemented several measures meant to cushion the economy from the adverse impacts of COVID-19, some of which had an impact on the SAS sector financing including:<sup>110</sup>

- ♦ Reduction of VAT from 16 to 14 per cent.
- ♦ Reduction of the resident corporate tax rate from 30 per cent to 25 per cent. This increased retained earnings available for re-investment.
- ♦ Reduction of the turnover tax rate to 1 percent. This helped businesses to reduce their tax obligation during the pandemic.
- ♦ Expedited payment of VAT refunds to improve business cash flows.
- ♦ Flexible provisioning requirements for banks in relation to loans that were performing as at March 2020 but subsequently went into distress as a result of the pandemic.

Many of these measures have since lapsed. Despite the pandemic, the market has continued to witness partnerships and financial closures. Table 6 highlights some recent financing activities in the SAS sector.

**Table 6: Banks and other investors in the SAS sector**

Financier	Type	Investment/available funding
Green Climate Fund (GCF)	Concessional loans	Energy Access Relief Fund (EARF) provides flexible loans to companies with liquidity challenges due to COVID-19. Loans range from USD100,000 to USD2.5 million for a maximum period of four years. <sup>111</sup>
Norfund & Development Finance Corporation (DFC) of USA	Equity Investment	Additional debt of USD15 million through the Brighter Life Kenya 1 Limited (BLK1) to d.light Kenya. <sup>112</sup>

107. World Bank (2020). Annual reports.

**Table 6: Banks and other investors in the SAS sector (Continued)**

Financier	Type	Investment/available funding
Lendable	Debt	USD550,000 debt financing for Raj Ushanga House <sup>113</sup> which distributes PAYG SHS from Azuri Technologies.
Commonwealth Development Corporation (CDC Group), Netherlands Development Finance Corporation (FMO), Norfund and others <sup>114</sup>	Debt and equity investment	Greenlight Planet secured USD90 million.
Marubeni (Japan) Company	Equity investment	Marubeni became an equity investor in Azuri Technologies by raising USD26 million equity investment for East and West Africa including Kenya. <sup>115</sup>
AfDB under the Facility for Energy Inclusion Off-Grid Energy Access Fund (FEI-OGEF)	Loan	Increased the lending to Solar Panda within a framework of USD15 million (KES1.58 billion) through Lion Head and Lendable. <sup>116</sup>
EU programme ElectriFI and impact investment platform TRINE <sup>117</sup>	Off-balance sheet debt financing	Azuri secured USD20 million off-balance sheet debt financing for working capital and expansion.
SunFunder, Triodos Investment Management, Nordic Development Fund, AlphaMundi and the AfDB's FEI-OGEF	Syndicated debt facility	SunCulture received USD11 million for solar irrigation expansion. <sup>118</sup>
FinDev Canada	Equity financing	M-KOPA received USD10 million (KES1.1billion). <sup>119</sup> A subsequent deal for an undisclosed sum gave Japanese investor Sumitomo a minority stake in the company. <sup>120</sup>
European Investment Bank (EIB) – Strengthening of African Off-Grid Solar Access <sup>121</sup>	Impact financing	USD25 million for enhancing energy access in Africa through the use of SAS systems, in conjunction with d.light design in five African countries including Kenya.
EIB <sup>122</sup>	Loan	EUR50 million (KES6.5billion) for financing of EDF's off-grid solar projects and ventures in Africa.
Oikocredit <sup>123</sup>	Loan	USD5 million to M-KOPA to support deployment of off-grid solar power products in four African countries, including Kenya.

## 5.2 Consumer Financing

The Kenyan mobile money market has grown to more than 40 million registered accounts and KES5.5 trillion (USD50.2 billion) in transactions.<sup>124</sup> Only about 20 percent of Kenyan adults are unbanked, over 65 percent of whom are women. Most of the unbanked are found in poor households. Even for the banked Kenyans, many have minimal savings.<sup>125</sup>

### Microfinance Institutions (MFIs)

MFIs in Kenya played a significant role in SAS financing before introduction of PAYG. This was due to their wide reach and less stringent terms compared to commercial banks. In order to increase energy access, development partners have been supporting MFI partnerships with SAS companies. Several SAS companies have partnered with MFIs to expand access to solar for low-income consumers in Kenya as shown in the following table.

**Table 7: Some of the MFIs involved in the SAS sector**

MFI/Lender name	Description/Loan product
Equity Bank <sup>126</sup>	In collaboration with the International Finance Corporation (IFC) and Lighting Africa launched the EcoMoto scheme where consumers apply for a SAS loan directly from their mobile phone, facilitating immediate purchase. <sup>127</sup> Equity Group Foundation (EGF) has provided 14,600 students with solar powered devices for online teaching during the COVID-19 lockdown. <sup>128</sup>
Micro-Enterprises Support Programme Trust (MESPT) <sup>129</sup>	Provides business support services to SMEs and financial institutions. Focus sectors include agriculture, climate smart/renewable energy. Products include financing of SAS water pumps and cold rooms.
Choice Microfinance Bank	Developed the Jitegeme Loan to finance acquisition of assets such as solar panels. <sup>130</sup>
Kenya Women Microfinance Bank (KWFT)	Has a loan product for the acquisition of solar energy products. <sup>131</sup>
Musoni	Works with d.light to help low-income customers acquire SHS. <sup>132</sup>
Sumac Micro Finance Bank	Entered into agreement with M-PAYG to provide customers with affordable solar appliances through its Kawi Loan. <sup>133</sup>
Bimas Kenya	Has a solar loan product in its portfolio. <sup>134</sup>
Juhudi Kilimo	Partnered with Winrock to promote a solar water pump loan product for small-scale farmers. <sup>135</sup>

125. World Bank (2018). *The unbanked*.

127. Lighting Africa (2018). *EcoMoto: Turning on the lights in Kenya in under 48-hours*.

### Mobile money networks

Kenya has one of the largest mobile money sectors in Africa and is a continental leader both in scale and innovation. In 2020, there were 52.5 million mobile wallets resulting in a 150 per cent penetration rate among the adult population (many people own more than one line). The country has a 91 per cent penetration of mobile subscriptions compared to Africa's 80 per cent.<sup>136</sup>

According to CBK data, mobile payments amounted to about KES1.661 trillion (USD 15.8Billion) in 2020 Q4 marking a 50 percent growth from 2019's Q4 amount of KES 1.109 trillion (USD 10.6 billion).<sup>137</sup> Earlier in 2020, CBK doubled the daily mobile money transfer limit from KES 70,000 (USD 638) to KES 150,000 (USD 1,368). The daily transaction ceiling was raised to KES 300,000 (USD 2,736) with customers also allowed to hold a maximum of KES300,000 in their wallets.<sup>138</sup> Further, transaction charges for mobile money transactions under KES1,000 (USD9.2) were scrapped as a way of reducing cash transactions due to the pandemic. PAYG solar customers increased their mobile money usage from 27 per cent up to 113 per cent.<sup>139</sup>

Some of the key mobile money players include:

- ♦ **M-Pesa:** Owned by Safaricom. Enables payments for M-KOPA products and numerous PAYG applications.
- ♦ **Airtel Money:** Owned by Airtel Africa that operates in 14 countries across Africa. It's partnership with Ecobank has allowed their customers across Africa to enhance their access to mobile financial services and transactions.<sup>140</sup>

- ♦ **Equitel:** A subsidiary of Equity Bank. This is more of a banking product than a mobile money service.<sup>141</sup>

- ♦ **T-Kash:** Owned by Telkom, has the smallest market share.<sup>142</sup>

The Communications Authority of Kenya statistics place M-pesa as the market leader with over 98 per cent subscriptions followed by Airtel Money and T-Kash at 1.1 per cent and 0.05 per cent respectively for the quarter ending March 31, 2020.<sup>143</sup>

An innovative credit facility is now available in the M-Pesa suite called Fuliza. It allows users to make third party payments even when they don't have money in the mobile wallet and pay later with interest.<sup>144</sup> There has also been a proliferation of mobile lending apps in Kenya, with more than 49 of them in operation.<sup>145</sup> Loans are disbursed and repaid through mobile money accounts.

### Remittances

According to CBK data, diaspora remittances significantly increased from KES 255 billion (USD 2.3 billion) in 2019 to KES 283 billion (USD 2.6 billion) in 2020.<sup>146</sup> While there is no specific study indicating the remittances going into the SAS sector, it is expected that some of the funds received end up in the sector.

As new financial innovations are introduced in the market, Kenyans in the diaspora have more convenient choices of transacting. For example, Safaricom has partnered with Skrill, a UK-based online payment company to enable diaspora remittances through M-Pesa.<sup>147</sup> This will likely result in beneficiaries back in Kenya having more disposable income and are likely to use some of the cash in settling PAYG payments or SAS loans.

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136. *Business Today* (2019). *Kenya leads Africa in smartphone usage*.

141. *Telecompaper* (2020). *Equitel is a banking service*

142. *Capital FM* (2018). *T-Kash integrates with M-Pesa in interoperability initiative*.

143. CCAK (2020). *Third quarter sector statistics report for the financial year 2019/2020*

146. CBK (2020). *Diaspora remittances*.

## 6. MARKET SUPPORT

### 6.1 Development Partners

Grants and technical assistance have been and continue to be important for early-stage SAS companies unable to secure commercial financing. The World Bank, for example, has provided funding for KOSAP, which will provide grants to companies that expand their operations to the underserved counties. Additionally, Power Africa,

through the United States Agency for International Development (USAID), announced five new grants totalling USD1 million to support financial institutions to design and roll out products to enhance development of SAS companies in sub-Saharan Africa, including Kenya. Table 8 lists the main donors active in the SAS space and the support they're offering.

**Table 8: List of active donor organisations in the SAS sector**

Financier	Type of assistance <sup>148</sup>	Investment/available funding
FCDO: Africa Clean Energy Technical Assistance Facility (ACE TAF)	Technical assistance	Assist 14 African governments to unleash the solar household market, tackle the policy and regulatory barriers to household energy access, and to accelerate a market-based approach to clean energy access.
Energy and Environment Partnership (EEP) Africa	Grants <sup>149</sup>	Supporting Agsol <sup>150</sup> (solar mills, EUR 787,192), Micro Energy Credits (solar appliances, EUR 374 871), EcoZoom (solar lighting, EUR 214,00) and Pawame (women-led company, SHS and solar appliances, EUR 204,035)
World Bank: Kenya Off-grid Solar Access Project (KOSAP)	Grants and Results-Based Financing (RBF)	USD3 million provided to 10 suppliers of SAS systems to supply and install 165,000 systems in the 14 counties.
Africa Enterprise Challenge Fund (AECF) <sup>151</sup>	RBF	USD4 million targeted at companies providing clean energy access to poor households. Objective is to reach 87,000 households
REACT Kenya Relief Fund <sup>152</sup>	Grant	USD2 million emergency COVID-19 relief fund for off-grid energy sector companies to continue providing rural customers with energy access.
EU/Africa Investment Platform	RBF	EUR25 million (USD29.8 million) targeted at enhancing private sector potential to achieve sustainable energy sector goals in Kenya. SAS is one of the target sectors. <sup>153</sup>

148. In 2021, we're contracting 9 new SAS grant projects in Kenya, Rwanda, Tanzania, Uganda and Zimbabwe.

149. EEP Africa also provides concessional loans. The only one for SAS is to SunCulture, but it was contracted in 2021.

150. Agsol's project is regional; the solar mills are also being distributed in Rwanda, Tanzania and Uganda.

151.

152.

153.



Financier	Type of assistance <sup>148</sup>	Investment/available funding
USAID	Grant Technical assistance	USD124 million mobilised under Power Africa Off-grid Project (PAOP) to support investment in Kenyan off-grid SHS and mini-grid sectors. <sup>154</sup>
Green Climate Fund	Grant	USD30 million fund to support off-grid energy firms through the pandemic.
AfDB Sustainable Energy Fund for Africa (SEFA) <sup>155</sup>	Concessional Loans / Technical assistance	USD 90 million concessional finance facility for renewable energy projects.
USAID and the United Nations Development Programme (UNDP)	Technical assistance	Under the Low Emission and Climate Resilient Development (LECRD) project, supported capacity development of technical vocational education and training institutions (TVETs) to offer training on solar PV and solar water heating systems. Also facilitated the development of a National Solar Water Heating Training Manual.
EU	Technical assistance	EUR3 million (USD 3.6 million), 3-year capacity building for national energy agencies and county energy personnel on renewable energy planning and implementation as per the Energy Act. <sup>156</sup>
Green Mini-Grid Programme with EU/DFID funding	Technical assistance	EUR450,000 (USD535,500) package to build capacity for the EPRA renewable energy team and develop a one stop licensing portal for the department. <sup>157</sup>

## 6.2 Training Institutions, Incubators, Accelerators

There are several institutions in Kenya that provide skills development in the SHS sector. The revised Solar PV systems regulations require training along the solar value chain for licensing and operation.<sup>158</sup> The growing SAS market, too, has increased demand for trained personnel.

Some of the institutions offering training in SAS include; Solar Academy (University of Nairobi), Jomo Kenyatta University of Agriculture and Technology (JKUAT),

Strathmore University Energy Research Centre, Micro-Grid Academy and others.<sup>159</sup>

The International Solar Alliance and French National Institute of Solar Energy are working with EACREEE towards building a regional solar academy.<sup>160</sup> The Google Accelerator Programme<sup>161</sup> focuses on Sustainable Development Goals with emphasis on technology start-ups that have viable social impact. Participants receive training, mentoring and technical support. In 2020, Solar Freeze, a Kenya solar start-up that distributes mobile cold storage units powered by renewable energy to rural farmers participated in this program.<sup>162</sup>

<sup>154.</sup>

<sup>155.</sup>

<sup>156.</sup> Interview with Kenya EU Project Team Leader.

<sup>157.</sup> Interview with GMG Team Leader.

<sup>158.</sup>

<sup>159.</sup> East Africa Centre of Excellence for Renewable Energy and Energy Efficiency (EACREEE), Sensei Institute of Technology, Institute of Energy Studies and Research, Best Bridge College, Spire, Women in Sustainable Energy and Entrepreneurship

<sup>160.</sup>

<sup>161.</sup>

<sup>162.</sup>

## 6.3 Market Data

Accessing accurate and timely data for the SAS sector in Kenya has been a challenge in the past as there is no one-stop data source. Many of the companies operating in Kenya depend on their own market research to make strategic decisions. Under the new Energy Act, 2019, one of REREC's responsibilities is to undertake feasibility studies and maintain a centralised database where renewable energy resources developers can access information. The agency has already budgeted USD5 million for this. GOGLA has been at the forefront of providing SAS market updates on regular basis.

Prior to the COVID-19 pandemic and part of 2020, several status reports were released. Some of the more prominent ones include:

- ♦ GOGLA (2020). Powering opportunity: The economic impact of off-grid solar.
- ♦ GOGLA (2020). 2020 off-grid solar market trends report.
- ♦ Solarplaza (2020). The Big 5 – Africa's fastest growing solar energy markets.
- ♦ IRENA (2020). Pay-As-You-Go models.
- ♦ MIT (2020). Designing off-grid refrigeration technologies for crop storage in Kenya.
- ♦ ESI (2019). Summary of the regional solar report – Eastern Africa.
- ♦ Springerlink (2019). The solar energy access in Kenya: A review focusing on pay-as-you-go solar home system.
- ♦ Energies (2020). Barriers and solutions for increasing the integration of solar photovoltaic in Kenya's electricity mix.



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ACE TAF PARTNERS INCLUDE:



STRATEGIC PARTNER:



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