GOGLA

The Voice of the Off-Grid Solar Energy Industry

Global Off-Grid Solar Market Report Semi-Annual Sales and Impact Data

January - June 2022, Public Report

In partnership with

LIGHTING GLOBAL
Catalyzing markets for modern off-grid energy

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Executive Summary

In the first half of 2022 the off-grid solar sector continued to grow. Global sales of solar lanterns, multi-light systems and solar home systems are now almost back on par with the highest sales for a given half-year recorded in the period of July to December 2019. Sales in most appliance categories have also shown growth. However, sales trends vary significantly by country and off-grid technology type. Much greater sales volumes are also needed for off-grid solutions to reach their full potential and help achieve SDG7 electrification targets.

Reaching SDG7 has become even more challenging due to slowed progress over the past two and half years, while the context in which companies are operating has undergone dramatic changes. Before the COVID-19 pandemic, the cost of off-grid solar was decreasing while the target market economies were growing. Since the pandemic, potential customer's income has shrunk while product prices have increased. Persistent supply chain challenges and increased inflation continue to dampen growth. While global sales volumes are starting to return to pre-COVID levels, there is in fact a vast disparity of trends depending on the country, product category, business model or individual company. Companies in the sector continue to show resilience and have demonstrated their ability to adapt and innovate.

To reach SDG7, the off-grid sector must play its part in not only reaching first time users, but also providing replacement products for existing off-grid solar customers.[1] However, the prolonged fall in sales volumes caused by COVID-19, along with products sold in the past reaching their expected lifespan and requiring replacements, means the return to growth is only gradually contributing to increased energy access. This report, based on sales data from off-grid solar and energy efficient appliance manufacturers affiliated to GOGLA,[2] provides data and insights on observable trends at a global, regional and country-level every six months. Key takeaways from this edition include:

Global Highlights

- **Global sales of solar energy kits have reached 4.33 million units, a 9% increase from the second half of 2021 and 25% higher than sales reported a year ago.**
- **Growth has been driven by cash sales (+15%) which reached close to 2.8 million units sold.** 86% of cash sales during the first half of 2022 are solar lanterns. This growth can in part be attributed to higher than usual sales to the humanitarian sector.[3]
- **PAYGo sales stagnated at 1.5 million units sold.** While this is not the growth the sector is hoping to see, it is 27% higher than a year ago and is partly explained by seasonality of sales in many markets in Sub-Saharan Africa where sales are typically higher during the second half of the year.
- **Sales trends amongst different categories of solar energy kits varied significantly.** Global lantern sales grew by 11% compared to the second half of 2021 to reach 2.8 million units. Multi-light system (MLS) sales grew by 12% to 891,000 units. Solar home system (SHS) sales decreased by 3% to 639,000 units: 11-20 Wp system sales decreased by 2%, 20-49 Wp sales have decreased by 28%, 50-100 Wp SHS sales grew by 20% and 100+ Wp products sales decreased by 9%.
- **Global sales of key appliances (TVs, fans, refrigeration units and solar water pumps) have recorded a 164% increase compared to the second half of 2021.** This jump in sales is tied to a sharp increase in fans sales reported in South Asia and is due to both increased participation of companies in the data collection, and actual growth reported by companies.
- **Fan sales grew from 134,000 units sold last reporting round to 698,000 units sold.** This increase is reflective of increased participation of companies in South Asia,and high demand for energy efficient fans in key markets like Pakistan.
- **TV sales continue their decreasing trend, dropping by 7% to 183,000 units sold.** This trend is tied to lower or stagnant sales in the SHS segment capable of powering TVs in East Africa.

1 Lighting Global, IFC, Efficiency for Access, GOGLA and Open Capital Advisors, Off-Grid Solar Market Trends Report 2022: Outlook 2030, 2022.
2 See detailed methodology here.
3 Exact data on sales to the humanitarian sector are not available to us, but large purchases can be identified. See Global Insights section of the report.

Executive Summary

- **Refrigeration unit (RU) sales grew 25% to 2,779 units sold between January and June 2022.** However, this remains low, especially given increased participation of companies reporting sales of this appliance category.
- **Solar water pump (SWP) sales grew 42% to 9,370 units sold.** This is the highest sales volume reported since 2020. However, increased participation of SWP manufacturers in this data collection round is a contributing factor.

Key regional takeaways

- **In East Africa, sales of solar energy kits reached just over 2.2 million units sold, an 8% increase compared to the second half of 2021.** This growth is partly enabled by strong results in Kenya, Ethiopia and Zambia, while many other important markets saw decreased sales during the first half of the year, likely due to seasonal patterns. **Key appliance sales for East Africa decreased by 14% to 106,000 units sold as TV sales continue to contract.** The region recorded increased sales of RUs (973 units) and SWPs (7,100 units).
- **In West Africa, total solar energy kit volumes also increased by 8% compared to the previous reporting round reaching 632,000 units sold.** Growth in the region is almost solely driven by Nigeria, with the country representing 74% of regional sales and 20% growth compared to the second half of 2021. **152,000 units of key appliances were sold in the first half of 2022, a 60% increase on the previous reporting round. This is the first time half-year sales of appliances in West Africa exceeded sales in East Africa.** Fans were the fastest growing segment in West Africa (+119%) followed by TVs (+25%). Sales in Nigeria represent 68% of regional sales and grew 168%.
- **In South Asia, a total of 610,000 solar energy kits have been sold, a 27% increase compared to the first half of the year.** This is largely driven by humanitarian bulk purchases in Afghanistan and Pakistan, while sales in the largest market (India) decreased by 5%. **Due to the aforementioned peak in fan sales, key appliance sales grew by 623% to reach 608,000 units sold.** Fans represent over 99% of units sold in the region.

Impact update

Sales data shared by companies are translated into impact through the GOGLA standardized impact metrics[4].

- **Since 2010, cumulatively, 401 million people have benefited from improved access to energy through off-grid solar energy kits reported by GOGLA affiliates, and 20 million from improved access to appliances since 2018.**
- **94 million metric tons of CO2e have been avoided by affiliate companies** – the equivalent of taking 20 million gasoline-powered cars off the streets for a full year. Additionally, emissions avoided through the use of high-performing TVs and fans since July 2018 reach close to 29,000 metric tons. This is equivalent to the greenhouse gas emissions avoided by running 8 wind turbines for a year[5].

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4 More information here.

5 United States Environmental Protection Agency (2021), Greenhouse Gas Equivalencies Calculator.

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About the Report

Authors

GOGLA

GOGLA is the global association for the off-grid solar energy industry. We are proud to champion one of the world's most innovative and impactful sectors. Hundreds of millions of people already benefit from affordable, high-quality, clean off-grid solar products and services. With the right support, our pioneering industry will be able to scale up rapidly to improve the lives of 1 billion people by 2030. To help make this happen, we promote, safeguard, and convene the industry, advocating for enabling policies and increased investment as well as supporting our 200+ members with effective services.
To find out more, visit www.gogla.org

Contributors

Lighting Global

Lighting Global is the World Bank Group's initiative to rapidly increase access to off-grid solar energy for the 733 million people living without electricity world-wide. Managed by the Energy Sector Management Assistance Program (ESMAP), we work with governments, the private sector, development partners, and end-users, continually innovating to unlock key market barriers and enable access and affordability to those that would otherwise be left behind. Our support has expanded to technologies that go far beyond lighting, including systems to power the needs of households, businesses, schools, and health centers. We operate with funding gratefully acknowledged from ESMAP and their donors.
For more information, please visit www.lightingglobal.org

Efficiency for Access Coalition

Efficiency for Access is a global coalition working to promote high performing appliances that enable access to clean energy for the world's poorest people. It is a catalyst for change, accelerating the growth of off-grid appliance markets to boost incomes, reduce carbon emissions, improve quality of life, and support sustainable development. Efficiency for Access consists of 20 Donor Roundtable Members, 19 Programme Partners, and more than 30 Investor Network members. Current Efficiency for Access Coalition members have programmes and initiatives spanning 62 countries and 34 key technologies. The Efficiency for Access Coalition is coordinated jointly by CLASP, an international appliance energy efficiency and market development specialist not-for-profit organisation, and UK's Energy Saving Trust, which specialises in energy efficiency product verification, data and insight, advice, and research.
For more information, please visit www.efficiencyforaccess.org

The appliances section of this report has been funded by UK aid from the UK government. However, the views expressed do not necessarily reflect the UK government's official policies.

Berenschot

Berenschot is a leading Dutch management consultancy firm with an extensive track record in supporting industry associations on market data collection. Berenschot has been elected by clients as one of the best management consultancy firms of the Netherlands. Berenschot maintains a high standard of confidentiality, as stated in the Berenschot Terms and Conditions.

Global Insights

Global Insights

Background

Economic developments in 2021 showed positive signs of recovery following a year marred by the impact of COVID-19 on the global economy. This optimism was cut short by higher-than-expected inflation, major lockdowns in China continuing to affect supply chains and economic output worldwide, as well as the unfolding consequences of the war in Ukraine.[6]

For the off-grid solar industry, this has translated into sustained uncertainty. On the supply side, while supply chains have started to recover, component costs remain high and lead times remain much longer than before the pandemic. The rise of the US$ compared to local currencies, and increasing fuel costs, leading to higher importation and transportation costs are also passed down to customers through higher prices. On the demand side, customers are also feeling the effect of higher fuel and food prices.

As mentioned in previous editions, companies have fared very differently depending on a multitude of factors including their business model, size, ability to raise funds, and exposure to different country markets. The last two and a half years have also been a period of accelerated innovation and change within the sector. 2022 so far included two major announcements as Solar Panda took over Azuri Technologies' portfolio in Kenya,[7] and Bboxx acquired PEG Africa.[8] Other key trends that accelerated during this period include increased specialization along the value chain, adaptation to weak-grid contexts and the diversification of product portfolios of distributors and PAYGo providers outside of the off-grid solar space.[9]

The appliance segment was at a nascent stage prior to the pandemic, and significant growth was hoped for in 2020 and 2021. While the growth that was anticipated before the COVID-19 crisis has not materialized, this segment has also shown clear signs of resilience and increasing maturity in terms of business model diversification and sales. Sustained support from donors and investors will be essential in driving and stabilizing sales of both SEK and productive uses of stand-alone solar power.

This report does not aim to provide a granular and extensive view of the whole sector, but it enables the reader to go beyond the global headlines to understand regional and country-level sales trends in key markets. While this report is the most comprehensive source of data on off-grid solar sales, we remind readers that information presented in this report is collected from manufacturers of off-grid lighting products and appliances affiliated to GOGLA and does not represent the entire market (see data collection methodology box below).[10]

For a deeper understanding of industry trends, World Bank/Lighting Global, IFC, Efficiency for Access, GOGLA and Open Capital Advisors recently published the Off-Grid Solar Market Trends Report 2022. The report explores and explains key trends across the whole industry, beyond affiliates and beyond sales and impact data. This 6th edition is published in two parts:

- A State of the Sector report which covers progress made towards Sustainable Development Goal 7, evolutions in pricing, business models, technologies, access to finance, company performance, policy, etc. since 2020.
- An Outlook report aimed at understanding what is needed for the sector to achieve its contribution to the SDG 7 targets by 2030.

6 IMF, World Economic Outlook, Update July 2022.
7 Solar Panda and Azuri Technologies announce Servicing Agreement, 2022.
8 Reuters, UK-based power Bboxx buys solar energy provider PEG Africa : statement, 2022.
9 Lighting Global, ESMAP, Efficiency for Access, GOGLA and Open Capital Advisors, Off-Grid Solar Market Trends Report 2022: State of the Sector Report, 2022.
10 Additional details can be found in the annexes of this report as well as on the GOGLA website.

Data collection methodology

GOGLA, Lighting Global and the Efficiency for Access coalition, with support from Berenschot, collect data from affiliate companies via an online survey every six months. Participating companies voluntarily share data on their product specifications and sales volumes on a per product, per country basis. For the period January-June 2022, 83 companies took part in the July data collection.

Analyses in this report are based on sales reported by manufacturers[11] and may not translate into sales to customers in the same time period. The data collected from affiliates is not extrapolated to the entire sector. Yet, it provides the broadest and most reliable dataset on the off-grid solar and energy-efficient appliances sector.[12]

Data goes through a thorough quality control and aggregation process to ensure robustness of the insights and to protect the confidentiality of companies' data.

Additionally, impact data in this report is based on the standardized impact metrics for the sector developed by GOGLA, Lighting Global and the Efficiency for Access Coalition. Data collected by GOGLA is widely used by organizations in the access to energy sector. In particular, they are a key source in tracking progress made towards Sustainable Development Goal 7.[13]

11 Manufacturers here designates companies selling their own branded products, by opposition with distributors of other companies' branded products.
12 Affiliates are estimated to represent 28% of the global off-grid solar market.
13 More information available here.

Global Insights

Sales and Impact Trends

Global Key Highlights

Sales figures presented here refer to the total of all off-grid solar energy kit and off-grid appliance sales reported by participating affiliates[14] in the period between January 1st and June 30th 2022.

Lighting Products Sold

4.33 million
off-grid solar energy kits

2.8 million
have been sold as cash products

1.5 million
sold via Pay-As-You-Go (PAYGo)

2.8 million
portable lanterns

891,000
multi-light systems

639,000
solar home systems (SHS)

36.7 MW
newly installed capacity globally through the off-grid solar lighting products

Appliances

183,000
TVs sold

698,000
fans sold

2,779
refrigeration units sold

9,370
solar water pumps sold

140,000
radios sold

14,000
other appliances[15]

14 Affiliates include GOGLA members, companies selling products that meet Lighting Global Quality Standards, and appliance companies of the Global LEAP Awards or the Low Energy Inclusive Appliances (LEIA) program.

15 Affiliates are given the opportunity to include other appliance types in their data reporting. Other appliances are generally not reported in sufficient volumes by participating companies to enable their inclusion, but provide an insight into the type of appliances that are sold. This round again, the main appliance types included are hair clippers, cookstoves and speakers.

Global Insights

Off-Grid solar energy kits

Global affiliate sales of solar energy kits between January and June 2022 reached 4.33 million units. This is a 9% increase compared to the second half of 2021 and almost on par with the 4.4 million sales recorded in the second half of 2019 before the COVID-19 pandemic.

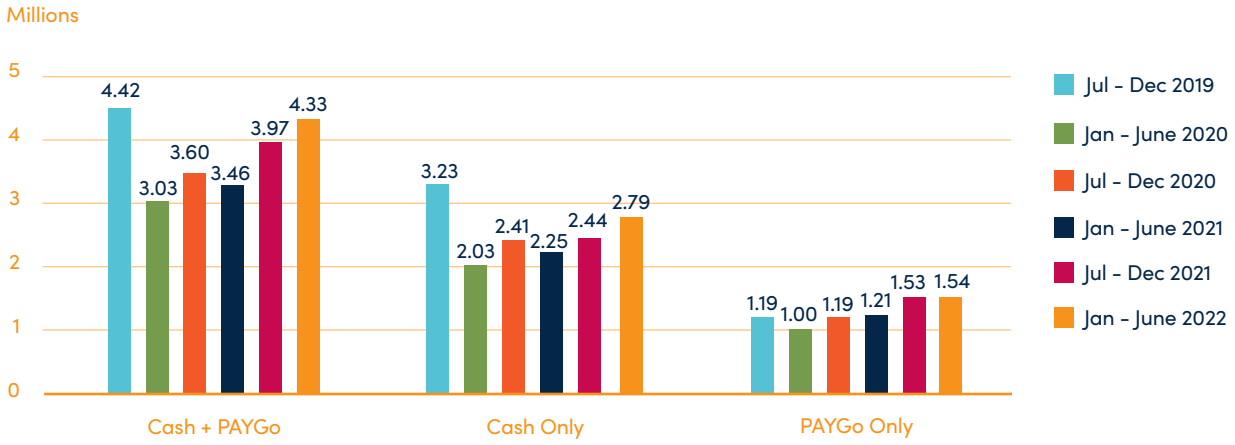
Of the 4.33 million units sold, 2.79 million were sold cash and 1.54 million products were sold PAYGo.

PAYGo sales have remained stable compared to the second half of 2021. The global value of products sold via PAYGo between January and June 2022 is $250 million.[16] While the sector would hope to see stronger growth, it should be highlighted that sales followed a similar pattern in the period July 2020 to June 2021 and this can be the sign of seasonal variations. Many markets in Sub-Saharan Africa typically see higher sales in the second half of the year.

Cash sales increased by 15% compared to the second half of 2021, and by 24% compared to the first half of 2021. The global value of cash sales for the reporting period January-June 2022 is $79 million.[17] Increased cash sales during this round can be partly attributed to unusually high sales in the humanitarian sector. While precise data about the share of off-grid solar sales going to the humanitarian sector is not available, large bulk purchasing orders to fragile and conflict-affected countries such as Afghanistan, Ethiopia, Syria, Yemen can be identified. Based on this proxy analysis, much higher sales to the humanitarian sector were recorded during the first half of 2022. They have been a key contributor to the high cash sales this round. While a large portion of these sales were to the Middle East, bulk purchases were also identified in South Asia, Sub-Saharan Africa and Ukraine.

Detailed insights by region and country can be found in the following chapters.

Figure 1 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits - World



NOTE:
Products are classified as 'Cash' when sold in a single transaction (including products purchased via tenders), or as 'PAYGo', when the customer pays for the product in installments over time or pays for use of the product as a service.

16 Market values are estimates. See Methodology Annex for details.
17 Market values are estimates. See Methodology Annex for details.

Global Insights

Solar lanterns

With 2.8 million units sold, solar lanterns represent 65% of sales during the first half of 2022. The overall share of lanterns in solar energy kits sold has stagnated between 63% and 65% since 2019. Lantern sales have increased 15% compared to the second half of 2021.

- **Sales of the smaller 0-1.5 Wp lanterns have decreased by 5% compared to the second half of 2021 to 1.2 million.**[18]
- **Larger 1.5-3 Wp lanterns have seen sales grow by 28% compared to the second half of 2021 after experiencing continually declining sales since 2018.** 25% of lanterns with phone charging were sold through PAYGo.

Multi-light systems

Sales of multi-light systems (3-10 Wp) reached 891,000 units between January and June 2022. This represents 21% of total global sales and a 12% increase compared to the second half of 2021.

343,000 units were sold cash, on par with July-December 2021, and 547,000 units were sold PAYGo, a 21% increase compared to the previous reporting round.

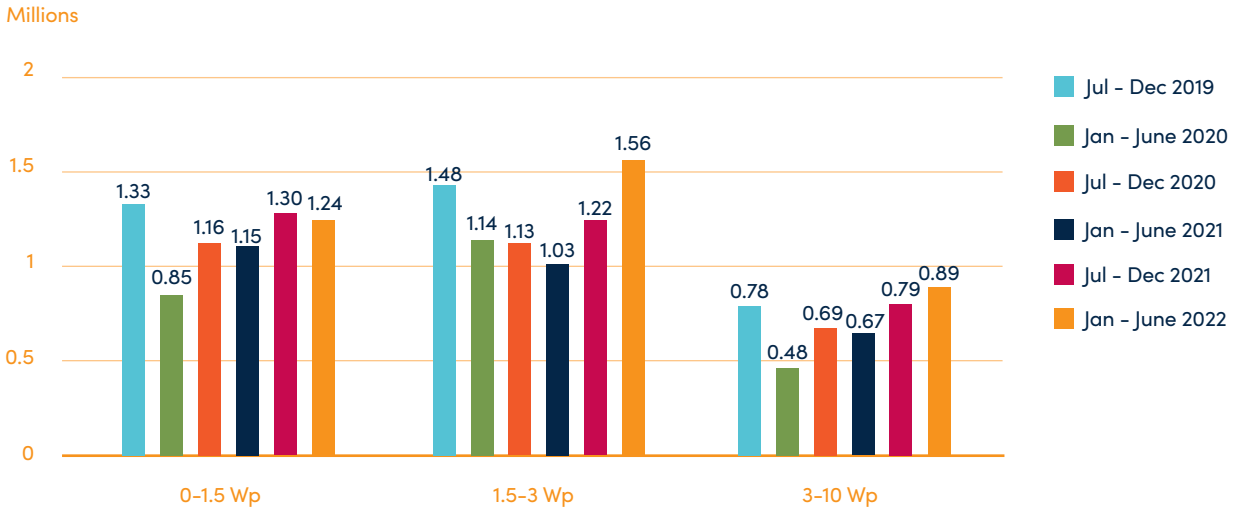
Solar Home Systems (SHS)

The broad category of SHS, comprising all products of wattage 11 Wp and higher,[19] with a wide variety in price points, recorded sales of 639,000 units in the first half of 2022. Sales have decreased by 3% compared to the previous six months period but are 6% higher than in the first half of 2021. **90% of all SHS sold between January and June 2022 were sold on a PAYGo basis.**

Within the SHS category, only 50-100 Wp products sales grew during the first half of 2022:

- 11-20 Wp sales have slightly decreased (-2%) compared to the second half of 2021 with 291,000 units sold.
- 21-49 Wp experienced the sharpest decrease (-28%) reaching 108,000 units sold.
- 50-100 Wp sales volumes have increased by 20% compared to the second half of 2021 totaling 211,000 units after two consecutive rounds of shrinking sales.
- 100+ Wp sales have decreased by 9% to 28,000 units sold.

Figure 2 - Semi-annual Evolution of Sales Volumes of Solar Energy Kit by Category (0-10Wp) - World



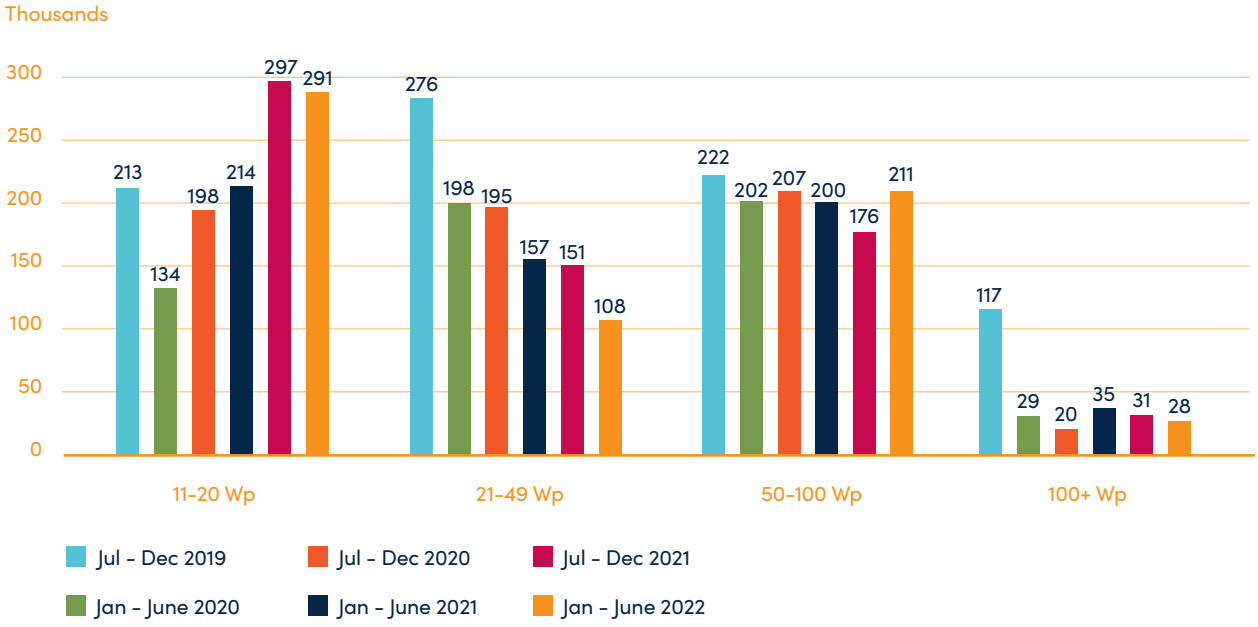
NOTE:
Lanterns 0-1.499 Wp include one light and no mobile charging, lanterns 1.5-2.999 Wp one light and mobile charging, and multi-light systems 3-10.999 Wp at least two lights and mobile charging. Solar home systems >11 Wp are classified based on panel wattage.

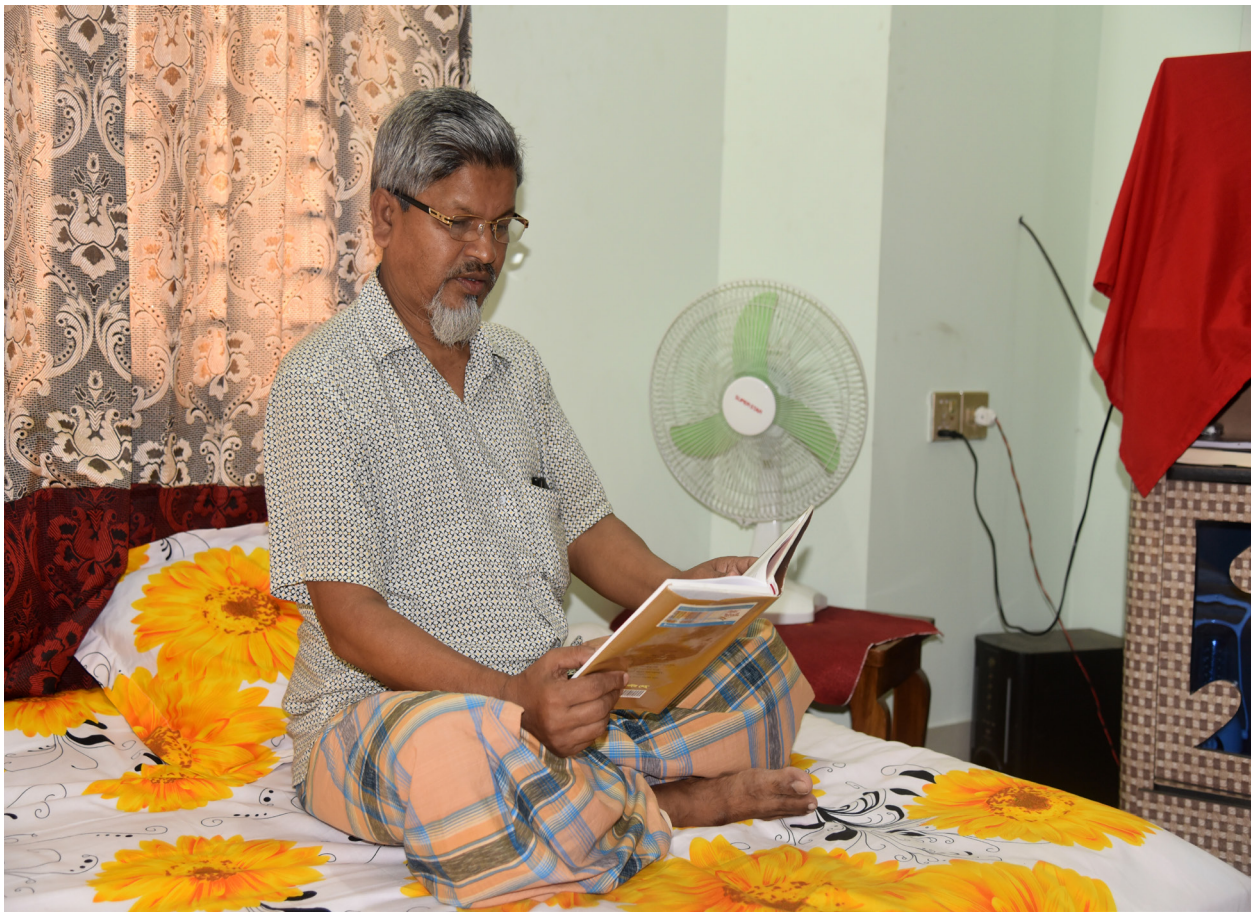
18 Compared to the previous reporting round, one product reference has been reclassified from 1.5-3 Wp to 0-1.5 Wp. This has had a limited impact on global sales volumes by product category. The report will highlight where the impact of that reclassification needs to be taken into account.

19 The largest systems included exceed 350 Wp.

Global Insights

Figure 3 - Semi-annual Evolution of Sales Volumes of Solar Energy Kit by Category (11-100+Wp) - World





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Global Insights

Off-grid solar appliances[20]

In the context of this series of sales reports, the appliance section focuses on reporting sales of appliances which have reached mainstream levels of production.[21] These are currently regarded as: TVs, fans, RUs and SWPs. These are collectively referred to as "key appliances" when reported in aggregate. These separate appliances are reported individually where sufficient sales warrant it.

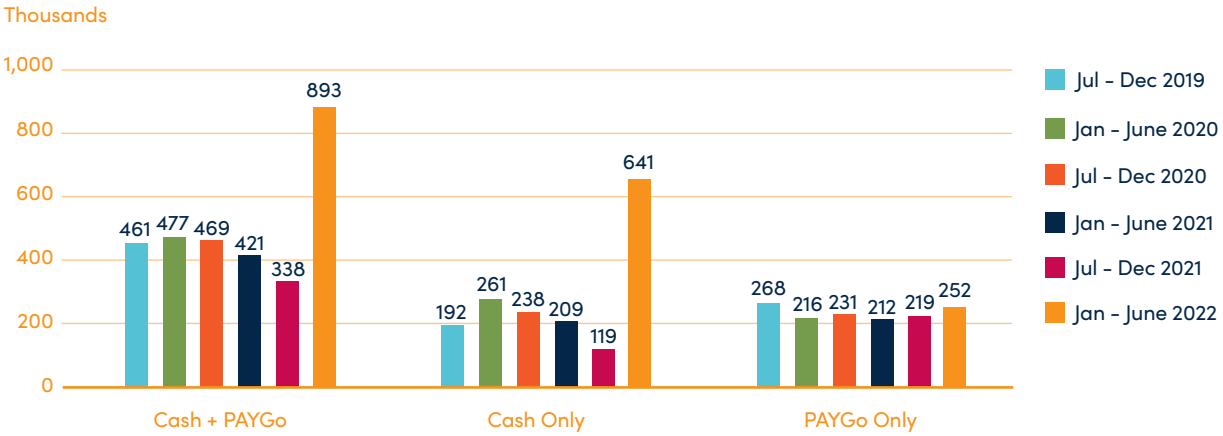
Between January and June 2022, affiliate companies reported total global sales of 892,000 units of the key appliances represented in this report. This is markedly higher than sales reported in most preceding rounds. The high sales are due to particularly high sales reported for fans in Pakistan due to both high sales of previously reporting companies and new companies joining the data collection (see South Asia section for more details). Fans represented 78% of key appliance volumes sold this round with 698,000 units sold. TVs with 183,000 units sold make up 20% of sales. While with 9,370 units sold, SWPs account for 1% of key appliances sold and the 2,779 RUs sold represent less than 1% of volumes.

The large spike in fan sales reported in Pakistan means the January-June 2022 data collection round has the highest reported global key appliance sales yet. However, this apparent increase hides stark differences between appliance types, regions and even countries which this report explores.

Televisions

TVs recorded 183,000 units sold in the first half of 2022. This represents a 7% decrease compared to the second half of 2021. Sales reached a peak of 281,000 units sold in the second half of 2019 and remained above 200,000 in both reporting rounds in 2020. TV sales were adversely affected by supply chain issues following the effects of the pandemic. Additionally, sales of SHS capable of powering TVs have overall faced challenges too and subsequently have reduced in the majority of markets.

Figure 4 - Semi-annual Evolution of Sales Volumes of Key Appliances - World



NOTE:
- The category 'Key Appliances' refers to the sum of all TVs, fans, SWPs and RUs reported as sold.
- Products are classified as 'Cash' when sold in a single transaction (including products purchased via tenders), or as 'PAYGo', when the customer pays for the product in installments over time or pays for use of the product as a service.

20 The sales data collection for off-grid appliances is at an early stage. Please note that, as the number of companies reporting their sales and product information is still growing, there may be limitations on how representative the data is of total sales in certain country markets. We therefore advise users to complement it with other sources where possible.

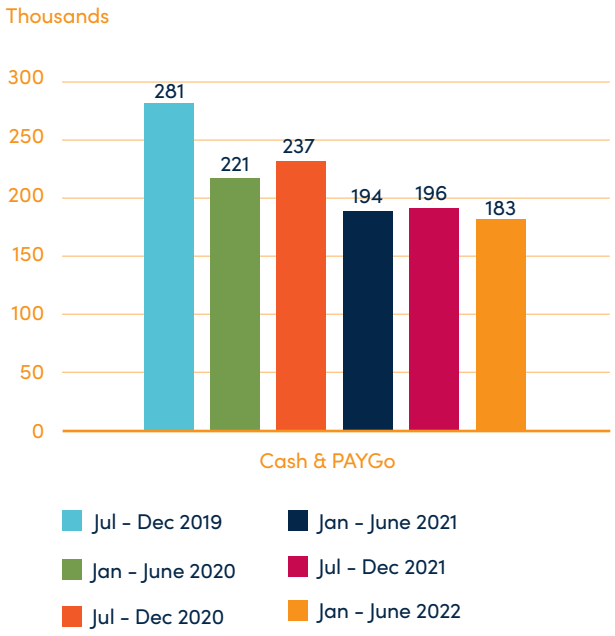
21 Radios were originally excluded due to being sold on a much higher scale. While we now feature radios in the report, we do not aggregate their sales to the Key Appliances.

Global Insights

The vast majority of TV sales are to Sub-Saharan Africa (99%) where they are predominantly bundled with SHS, of which 98% are sold on a PAYGo basis.

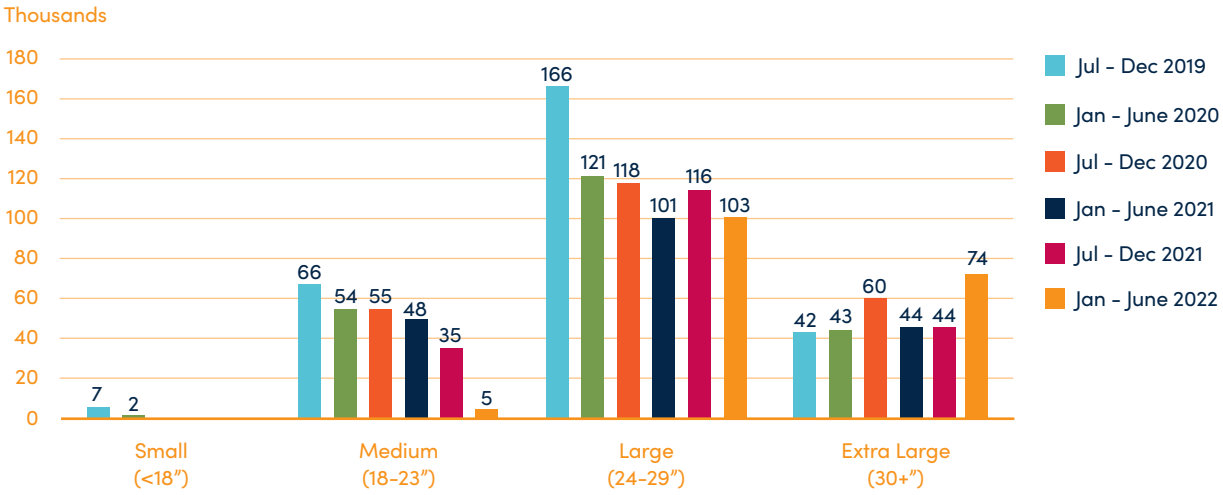
Overall, the market is moving away from small TV sizes towards larger models. This trend is particularly noticeable this round as medium size TV sales shrank by 86% while extra-large TV sales grew by 70%. This is in part due to the re-categorisation of one product from medium to large size, but this also aligns with lower sales of 21-49 Wp SHS and higher sales of 50-100 Wp sales this reporting round. In terms of the diversity of product categories, the majority of TVs sold fall in the large category (24-29") with 103,000 units. These are followed by extra-large (30+") TVs[22] with 74,000 units sold and then medium TVs (18-23") with close to 5,000 units.

Figure 5 - Semi-annual Evolution of Sales Volumes of TVs – World



NOTE:
Products are classified as 'Cash' when sold in a single transaction (including products purchased via tenders), or as 'PAYGo', when the customer pays for the product in installments over time or pays for use of the product as a service.

Figure 6 - Semi-annual Evolution of Sales Volumes of TVs by Category - World



22 Extra-large TVs sold in July-December 2022 range from 32" to 43".

Global Insights

Fans

Fan sales in the first half of 2022 recorded 698,000 units sold. This is a 421% increase compared to sales reported during the second half of 2021. This increase can in large part be attributed to an increase in the number of companies reporting fan sales in South Asia which means data collected this round is not directly comparable with previous reporting rounds.

Fan sales follow a particularly seasonal pattern. Higher and more humid temperatures drive distributors to build up stocks in the first half of the year. Therefore, higher sales are also generally observed during the first half of the year.

87% of sales occurred in South Asia where fans are generally sold on a cash basis and mostly not bundled with a solar energy kit. This reflects the prevalence of component-based sales in the Asian solar market, as opposed to solar kits and the associated Distributed Energy Service Company (DESCO) business models that have been widely adopted in Sub-Saharan Africa. Fan sales in Sub-Saharan Africa represented just 11% of total volumes during the first half of the year. In contrast with the trend in Asia, across Sub-Saharan Africa, 80% of fans were sold bundled with a power system – usually a SHS – and are also more likely to be sold via PAYGo.

Across all geographies, 42% of fans sold between January and June 2022 were sold bundled with a power source, compared to 39% during the previous reporting round. This is due to a mix of growing fan sales in West Africa where they are typically bundled with an SHS and higher reported volumes of fans sold with a power source in South Asia. Further data collection is required to better understand this trend in South Asia.

Ceiling fans are by far the best-selling category of fans this reporting round. Low participation of companies selling these fans in past rounds means there were few other comparative rounds available when data was published. However, in the first half of 2019, sales of ceiling fans reached close to 350,000 units.

Pedestal fans are the second most popular category with 129,000 units sold and are 140% higher than in the previous reporting round.

Table fan sales remain stable with close to 42,000 units sold in the first half of 2022.

Figure 7 - Semi-annual Evolution of Sales Volumes of Fans – World

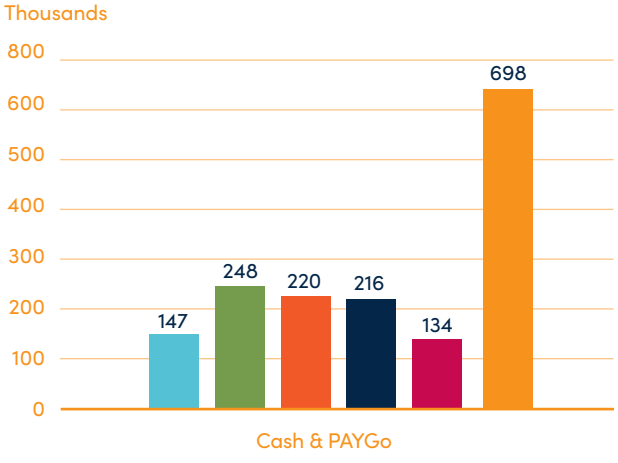
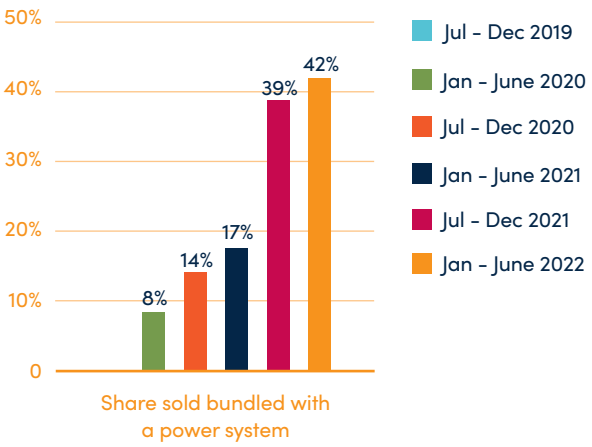
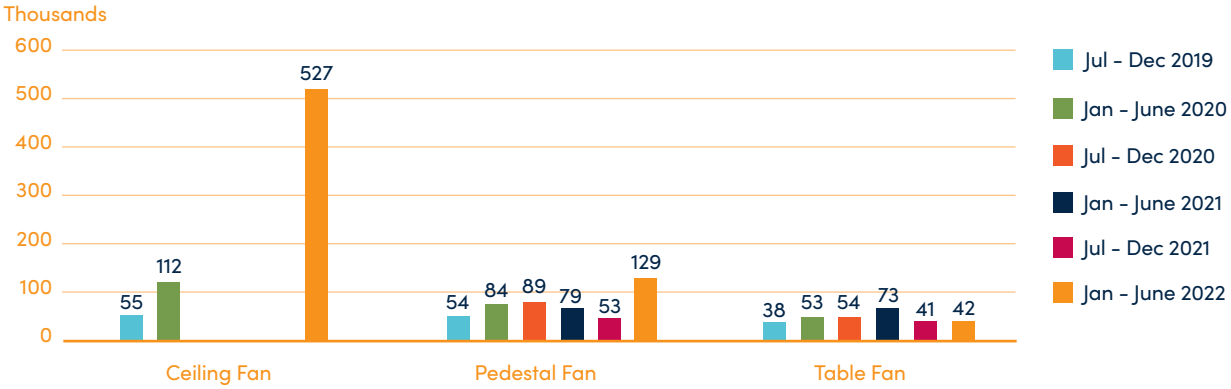


Figure 8 - Semi-annual Evolution of the Share (%) of Fans Sold Bundled with an Energy Source - World



Global Insights

Figure 9 - Semi-annual Evolution of Sales Volumes of Fans by Category - World



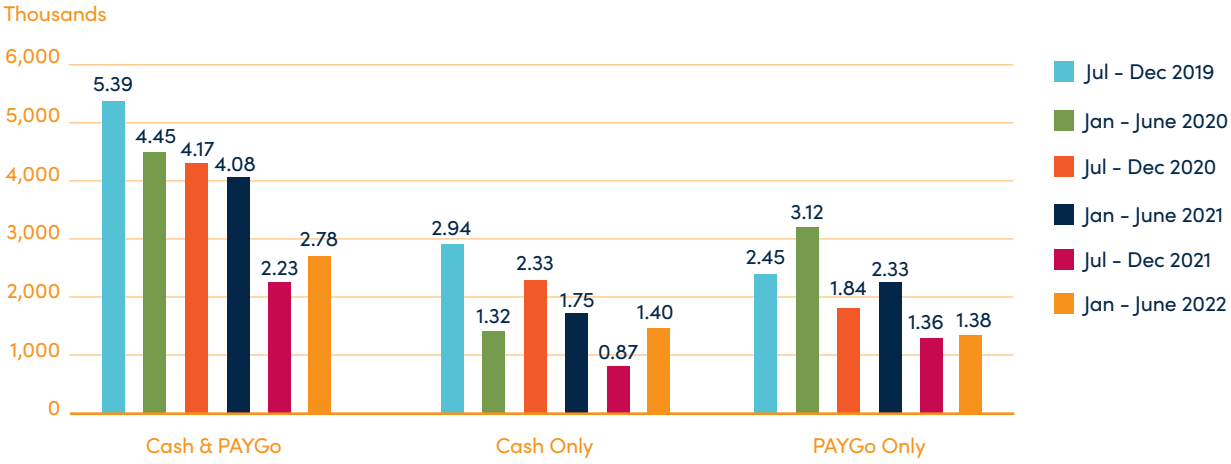
Refrigeration Units (RUs)

Between January and June 2022, 2,779 units were sold globally. After remaining fairly stable for three consecutive reporting rounds, RU sales dropped by 45% in the second half of 2021. Sales have increased by 25% this reporting round but remain low compared to volumes reported in 2018 to 2020.

Refrigeration remains a nascent segment and products are expensive. Companies focusing on these technologies have yet to reach commercial scale and the impacts of the pandemic and current uncertainties around supply and customers' ability to pay may further delay this movement.

In terms of product category diversity, this round, multi-temperature refrigerators with freezer capability overtook refrigerators as the largest category representing 48% of sales. Refrigerators represent 36% of total sales. Finally, refrigerator-freezer combos and freezer represent the remaining 16%.

Figure 10 - Semi-annual Evolution of Sales Volumes of RUs - World



NOTE:
Products are classified as 'Cash' when sold in a single transaction (including products purchased via tenders), or as 'PAYGo', when the customer pays for the product in installments over time or pays for use of the product as a service.

Global Insights

Including the market for off-grid vaccine cold chain equipment

This report does not fully reflect the significant institutional market for off-grid vaccine cold chain storage equipment. For the first time, companies selling these solutions have been asked to report them as part of the data collection. For now, due to limited companies participating, this number cannot be communicated publicly. These refrigerators follow a centrally-procured model managed by the World Health Organization and partners under Gavi, the Vaccine Alliance. This equipment and the institutional markets for their use differ significantly from the lower-cost specialist off-grid refrigerators designed to meet household or light commercial needs. However, in this emerging mass market we have seen **a significant amount of technology transfer and borrowing of designs developed to produce reliable and highly effective equipment for the vaccine market.** A notable example is the **development of 'solar direct-drive' or SDD refrigerators** for these mainstream off-grid markets. SDD refrigerators connect directly to a PV panel, and generally include an integrated thermal and/or electric battery to allow for autonomous operation at night or on cloudy days when there is no solar power. SDD technology uses solar energy to freeze water packs or other phase change materials. These ice packs or 'ice batteries' keep the refrigerator cool.[23]

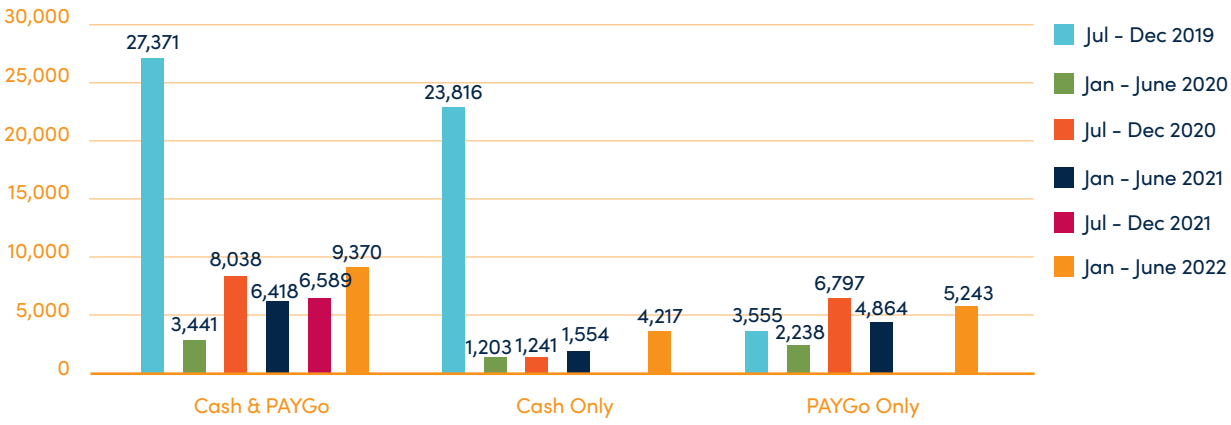
Solar Water Pumps (SWPs)

With 9,370 units sold in the first half of 2022, SWPs experienced a 42% increase in sales volumes compared to the second half of 2021. However, this variation in sales can in part be tied to increased participation and the real growth is likely more limited. Due to a peak caused by bulk procurements from government programs in South Asia, data is not comparable with the second half of 2019.

56% of all SWPs sold were sold through PAYGo and overall 81% were sold bundled with a power source.

It is particularly noticeable that in this appliance segment very limited visibility is available on sales volumes anecdotally known to be large markets particularly in India, other Asian and some Sub-Saharan African countries. This is due to the lack of affiliation of the sales data partners with the manufacturer/distributor companies which dominate in these areas.

Figure 11 - Semi-annual Evolution of Sales Volumes of SWPs - World



NOTE:

- Products are classified as 'Cash' when sold in a single transaction (including products purchased via tenders), or as 'PAYGo', when the customer pays for the product in installments over time or pays for use of the product as a service.
- High sales reported in July-December 2019 can be linked to government programs in India and Bangladesh

23 Efficiency for Access Coalition (2021), Refrigerators Solar Appliance Technology Brief.

Other Appliances

Sales are also recorded for a wide variety of other off-grid appropriate appliances. With the exception of radios, other appliances are generally not reported in sufficient volume by participating companies to enable their inclusion, but provide an insight into the type of appliances that are sold. These products are not included under the 'key appliances' category, as these appliances are what we can call at best 'near to market' or 'niche market'. This round, the main appliances in this category were radios with 140,000 units sold. All other appliances sold totaled 14,000 units. Among them, the main categories were hair clippers/shavers, solar electric cookstoves and stereo systems.

The variety of products reported has expanded over time. This is seen to reflect the combination of several reinforcing factors; clear demand for an ever-increasing range of services from people living in off-grid and weak-grid areas, an interest from private sector companies in developing efficient high-performance appliances that satisfy these domestic and productive use demands and an ability to source funds to pay for these product and business model innovations.

Main markets by appliance type January June 2022

The markets for efficient appliances have been largely and recently built on maturing markets for solar energy kits and as such is still nascent. Similarly, the data collection efforts are also under development. Due to these factors, it can sometimes be difficult to get a clear picture of the main markets per appliance type throughout this report as there are several cases where collected country data is either not shown (due to not satisfying the data confidentiality rules[24]) or where some of the major appliance suppliers have not yet chosen to participate in contributing data to the reports. Below is a table summarizing the top 5 markets for each appliance type by sales volume reported by Affiliates between January and June 2022. For RUs and SWPs, due to the limited number of companies participating, the main markets identified may not be representative of the sector, but biased towards the focus areas of participating companies.

Table 1 - Top 5 Markets by Appliance Type Based on Sales Volumes Reported by Affiliates Between January and June 2022

Rank	TVs	Fans	Refrigeration units	Solar Water Pumps
1	Kenya	Pakistan	Nigeria	Kenya
2	Nigeria	Nigeria	Kenya	Uganda
3	DRC	Bangladesh	Vanuatu	India
4	Guinea	India	Liberia	Togo
5	Senegal	Philippines	Senegal	Cambodia

24 See Methodology Annex for more details

East Africa Insights

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Regional Sales Trends

Off-Grid solar energy kits

Sales of off-grid solar energy kits in East Africa between January-June 2022 exceeded 2.2 million units. This is an 8% increase compared to the second half of 2021 and a 13% increase compared to the first half of 2021.

Cash sales increased by 22% compared to the second half of 2021 and are 12% higher than during the first half of 2021. Conversely, PAYGo sales decreased by 5% compared to the previous reporting round but remained 14% higher than during the first half of 2021.

Product Trends

Sales of lanterns increased compared to the previous round. Solar lanterns with phone charging in particular grew by 23%, with 44% sold through PAYGo.

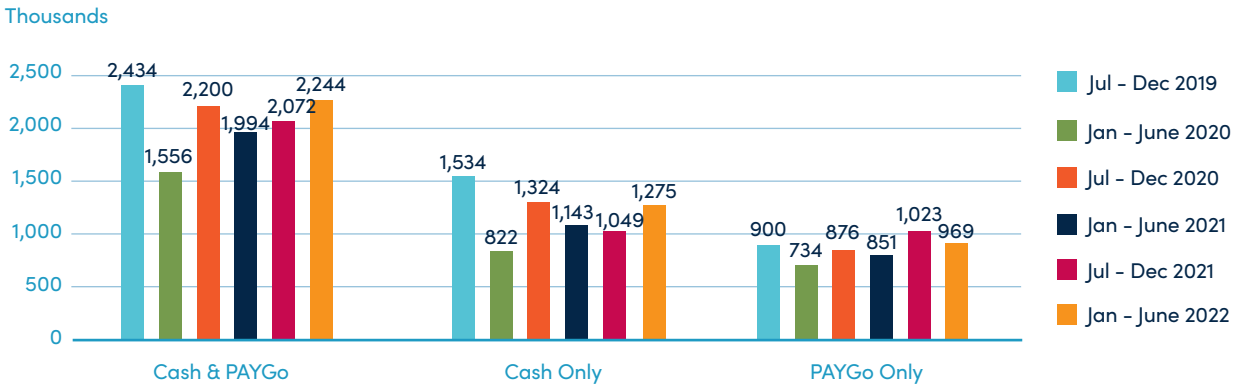
Multi-lighting systems sales decreased by 9% since the second half of 2021, but remain 8% higher than in the first half of 2021.

Overall SHS sales decreased by 3% compared to the previous round, but are 5% higher than during the first half of 2021. The decrease in sales is particularly noteworthy in the 21-49Wp category.

Countries Overview

Several large markets recorded a growth in sales compared to the previous data collection round. These include Kenya, Ethiopia, Zambia,

Figure 12 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits - East Africa



NOTE:
Products are classified as 'Cash' when sold in a single transaction (including products purchased via tenders), or as 'PAYGo', when the customer pays for the product in installments over time or pays for use of the product as a service.

Table 2 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits by Category - East Africa

Categories		Jan-Jun 2022 volumes Solar Energy Kits (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021	Share of PAYGo
Lanterns	0-1.5Wp	**611,245**	9%	-17%	0%
	1.5-3Wp	**871,794**	23%	57%	44%
Multi-light systems	3-10Wp	**461,534**	-9%	8%	66%
Solar Home Systems	11-20Wp	**134,029**	12%	42%	95%
	21-49Wp	**77,658**	-21%	-28%	100%
	50-100Wp	**79,211**	17%	28%	91%
	100+Wp	**8,227**	-28%	-1%	100%

East Africa Insights

and Rwanda. Several of the markets where sales declined compared to the second half of 2021 generally have seasonal sales variations with lower sales in the first half of the year. This is the case for Uganda, Malawi and Mozambique. Given the large relative weight of Kenya in the region, sales trends in East Africa tend to reflect trends in Kenya. The chart below shows what East Africa trends are both with and without sales in Kenya.

Off-grid solar appliances

Between January and June 2022, the total recorded number of key appliances sold in East Africa reached 106,000 units. This is a 14% decrease compared to the second half of 2021, and an 18% decrease compared to the first half of 2021. TV sales have been on a declining trend since the COVID-19 pandemic and are 43% lower now than during the second half of 2019. TVs are the most common appliance sold in East Africa and decreases in their volumes sold is the main driver of this overall trend.

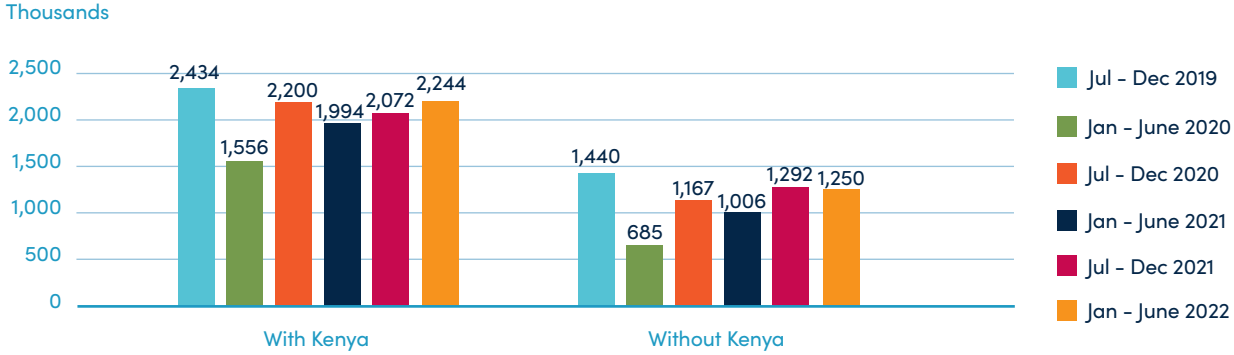
Key appliance sales in East Africa represent just 39% of sales in Sub-Saharan Africa in the first half of 2022. In both rounds of 2021, East Africa represented at least half of sales in Sub-Saharan Africa.

Table 3 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits by Country - East Africa

Region / Countries	Jan-Jun 2022 volumes Solar Energy Kits (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021
East Africa	**2,243,698**	**8%**	**13%**
Kenya	994,060	27%	1%
Ethiopia	268,931	31%	15%
Zambia	216,189	44%	151%
Somalia	167,050	18%	21%
Rwanda	156,985	13%	61%
Uganda	123,098	-19%	11%
Tanzania	112,411	-31%	-35%
Malawi	74,123	-37%	63%
Madagascar	63,090	6%	91%
Mozambique	56,600	-26%	80%
Zimbabwe	8,348	-61%	-43%
Burundi	2,813	-75%	

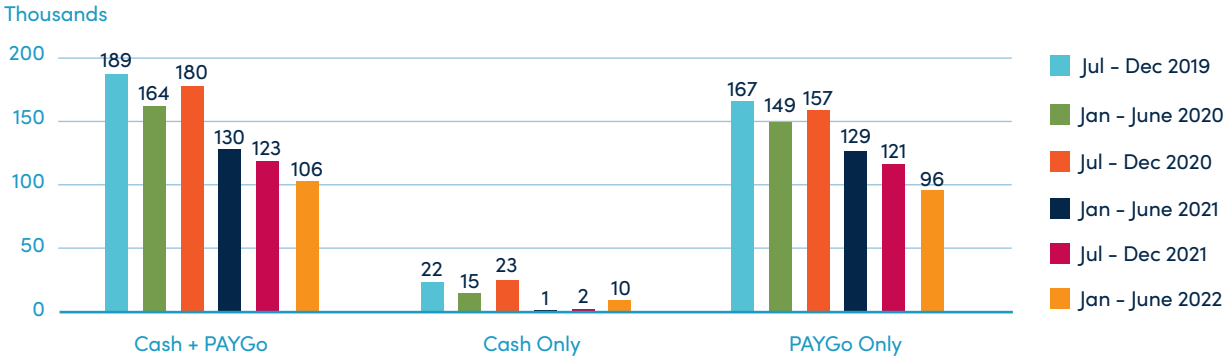
NOTE:
Countries not featured in this table did not see enough companies reporting to pass the three-data point rule

Figure 13 – Semi-annual Evolution of Sales Volumes of Solar Energy Kits - East Africa with and without Kenya



East Africa Insights

Figure 14 - Semi-annual Evolution of Sales Volumes of Key Appliances - East Africa



Product Trends

TVs sold in East Africa account for 54% of total TV sales in Sub-Saharan Africa with 98,000 units. This is a 17% decrease compared to the second half of 2021. Lower TV sales are not surprising given lower sales of the SHS ranges which typically account for a significant proportion of solar energy kits powering such appliances. Among TVs, large TVs (24-29") represent almost 57% of volumes, followed by extra-large TVs (30+", 40%) while medium and small TVs represent just 3% of sales. This represents an acceleration of the broader trend of lower volumes sold for small TVs and increasing amounts of larger TVs mentioned in previous editions of this report. Further data collection will be needed to confirm the extent to which the shift to almost exclusively large and extra-large TVs is durable and whether this is a trend across diverse customer segments or amongst wealthier customers.

RUs sold in East Africa represent 42% of total Sub-Saharan African sales, up from 26% in the last round. This is the first round with increased sales of RUs in East Africa since 2019. However, it should be noted this can be in part explained through increased participation of companies reporting RU sales this round. The most common type of RUs sold are refrigerators followed by refrigerator-freezer combos, multi-temperature refrigerators (which can be set to function either as fridges or freezers) and freezers.

SWPs sold in East Africa represent 86% of total Sub-Saharan African sales, with 9,370 units. This is a 42% increase compared to the second half of 2021 and 46% higher than sales in the first half of 2021. This growth is in part due to increased participation in the data collection from companies selling SWPs.

Sales of fans in the region reached 497 units sold this reporting round. This is a decrease from 716 units sold in the second half of 2021. However, this is evidence of the current limited appetite for fans amongst solar energy kit customers in East Africa.

Visibility on the volume of TV or fan sales through channels who do not report as part of this report is not available. But anecdotal reports on SWPs indicate that significant volumes are being sold through traditional component-based solar, water pump and agricultural equipment retail channels. While the opposite is evident for RUs, with very few being sold in commercial markets for off-grid use.

Table 4 - Semi-annual Evolution of Sales Volumes of Key Appliances by Type - East Africa

Appliance	Jan-Jun 2022 volumes Key appliances (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021	Share reported as sold PAYGo	Share sold bundled with a power system
TVs	**97,602**	-17%	-21%	-	97%
Fans	**716**	-31%	73%	-	-
RUs	**973**	117%	-35%	36%	31%
SWPs	**7,103**	61%	50%	56%	82%

East Africa Insights

Countries Overview

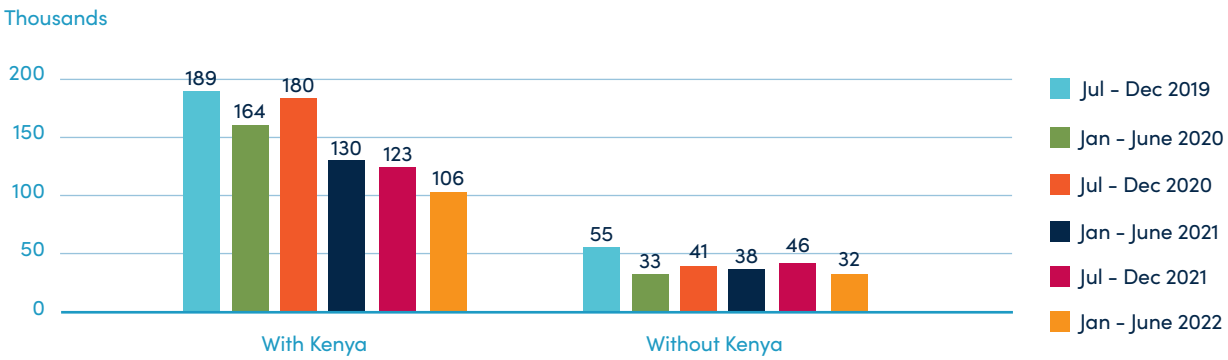
Lower sales in Kenya, Tanzania and Zambia are the main vectors for lower regional sales. Kenya is by far the largest market in the region and no other market can compensate for major sales trends in Kenya. Figure 15 below shows that, while sales in Kenya have been steadily declining since 2019, the rest of the region has been on an overall growth trend with high seasonal variability. However, with sales lower in the first half of 2022 than in the first half of both 2020 and 2021, it could be that lower sales are recorded throughout the region in 2022 compared to 2021.

Table 5 - Semi-annual Evolution of Sales Volumes of Key Appliances by Country - East Africa

Region / Countries	Jan-Jun 2022 volumes Key appliances (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021
East Africa	**106,175**	**-14%**	**-18%**
Kenya	74,593	-4%	-19%
Tanzania	12,842	-17%	-27%
Rwanda	5,428	26%	107%
Madagascar	4,222	213%	
Zambia	3,525	-62%	-53%
Uganda	2,967	138%	117%
Mozambique	1,283	-57%	3%
Ethiopia	162		-51%

NOTE:
- The category 'Key Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units.
- Products are classified as 'Cash' when sold in a single transaction (including products purchased via tenders), or as 'PAYGo', when the customer pays for the product in installments over time or pays for use of the product as a service.
- Countries not featured in this table did not see enough companies reporting to pass the three-data point rule.

Figure 15 - Semi-annual Evolution of Sales Volumes of Key Appliances - East Africa with and without Kenya



East Africa Insights

Kenya Insights

Background

In 2021 Kenya reintroduced its tax exemption on off-grid solar products. Although the return to growth in 2022 cannot be entirely attributed to this tax exemption, it is likely that the decision will have been favorable in a context of high inflation in Kenya – reaching 7.5% in June 2022.[25] Another key development in the first semester were the presidential elections. While companies have shared that the election led to increased demand for TVs, this has not been reflected in the sales reported by affiliates.

Several on-going interventions were reported to us as having supported the sector in Kenya:

- The Kenya Off-Grid Solar Access Project for Underserved Counties (KOSAP) is being implemented by the Ministry of Energy with financing from the World Bank. The project closing date is expected to be extended until May 2025. Over 20 firms have been selected, to date, with the aim of selling 250,000 solar home systems in 14 counties. KOSAP hit the milestone of 100,000 connections supported in 2022. Further applications are welcome.
- The Sustainable Energy for Smallholder Farmers (SEFFA) project (EnDev, Ikea Foundation, GIZ, SNV) with EUR 8 million to support PUE in the dairy and horticultural value chains in Ethiopia, Kenya and Uganda, has just got underway though significant impact on selected appliance sales may take some time to materialize.

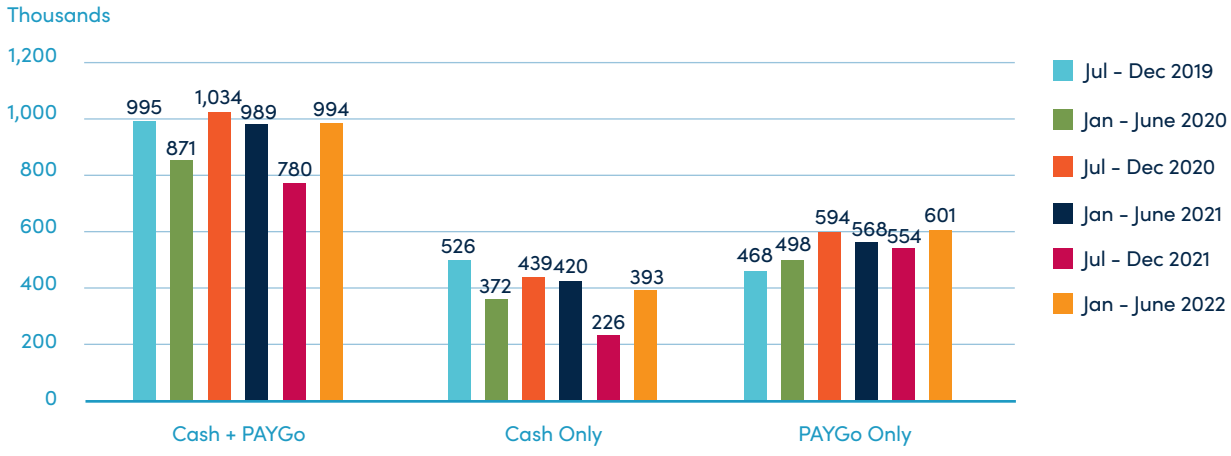
Sales Trends

Off-Grid Solar energy kits

Sales volumes grew by 27% compared to the second half of 2021 after having dropped by 21% last reporting round compared to the first half of 2021. 994,000 units were sold in the first half of 2022, a 1% increase on the first half of 2021.

The growth in sales is mostly driven by sales of lanterns and multi-light systems with sales of small lanterns in the 0-1.5Wp category growing by 58% compared to the second half of 2021, sales of lanterns with phone charging (1.5-3Wp) growing by 25% and MLS sales growing by 48%. SHS sales on the other hand decreased by 9%. Although detailed PAYGo sales data cannot be shared in this report due to data confidentiality, large volumes of solar lanterns (1.5-3Wp) are reported as PAYGo sales.

Figure 16 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits – Kenya



25 IMF, IMF Executive Board Completes the Third Reviews of the ECF and EFF Arrangements for Kenya Providing a US$235.6 Million Disbursement, 2022.

East Africa Insights

Kenya Insights

Appliances

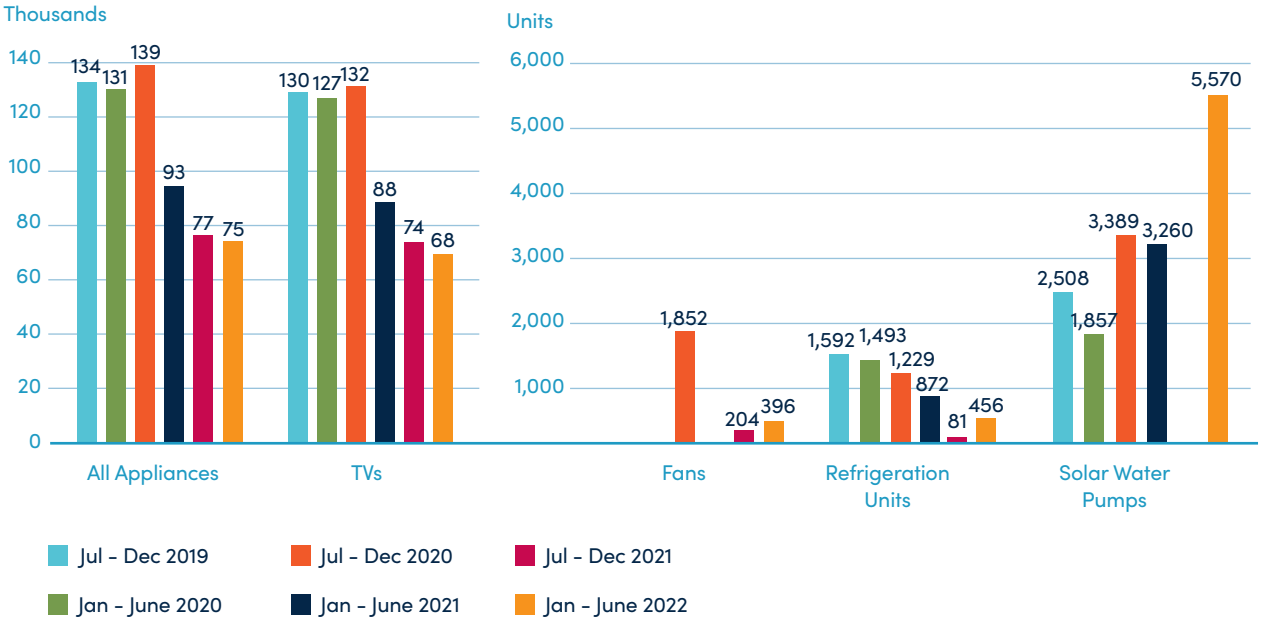
The appliance market in Kenya is primarily dominated by TVs (91% of key appliance sales). Most TVs are sold bundled with SHS. The decrease in TV sales can be linked to the lower reported sales of SHS capable of powering TVs.

Fan sales increased from 204 units sold in the second half of 2021 to 396 units sold this round.

RU sales are back up to 456 units after an all-time low in the second half of 2021 of 81 units sold. They remain significantly lower than in the first half of 2021 when 872 units were sold, despite an increase in participation in the data collection.

Although SWP sales data for the second half of 2021 cannot be shared publicly, sales of SWP have increased significantly this round. With 5,570 units sold, sales are 71% higher than in the first half of 2021. Increased participation is also a contributing factor.

Figure 17 - Semi-annual Evolution of Sales Volumes of Key Appliances - Kenya



East Africa Insights

Ethiopia Insights

Background

Since 2019, Ethiopia has been engulfed in a multi-faceted crisis with the conflict in Tigray leading to over 2.5 million internally displaced people,[26] the COVID-19 pandemic and foreign exchange constraints. Additionally, inflation in June 2022 reached 34%, putting significant pressure on household finances.[27]

There have been steps taken in favor of off-grid solar in the market. In 2019, the government of Ethiopia announced 35% of its ambitious electrification targets would be met by off-grid solutions.[28]

In 2021, the World Bank approved the Access to Distributed Electricity and Lighting in Ethiopia (ADELE) project which includes a $50 million off-grid solar component that will provide access to finance in both foreign exchange and local currency, as well as an RBF for solar energy kits and productive use of energy (PUE) products. The project aims to further increase market intake and support expansion of the supply chains in rural areas. It also includes a $55 million component on the electrification of public facilities. As the project is not yet disbursing, its potential impacts are not yet expected to be reflected in the sales captured in this report.

Ethiopia is also one of the countries targeted by the €8 million Sustainable Energy for Smallholder Farmers project funded by EnDev and the Ikea Foundation, which aims to support PUE in dairy and horticultural value chains across Ethiopia, Kenya and Uganda.

Sales Trends

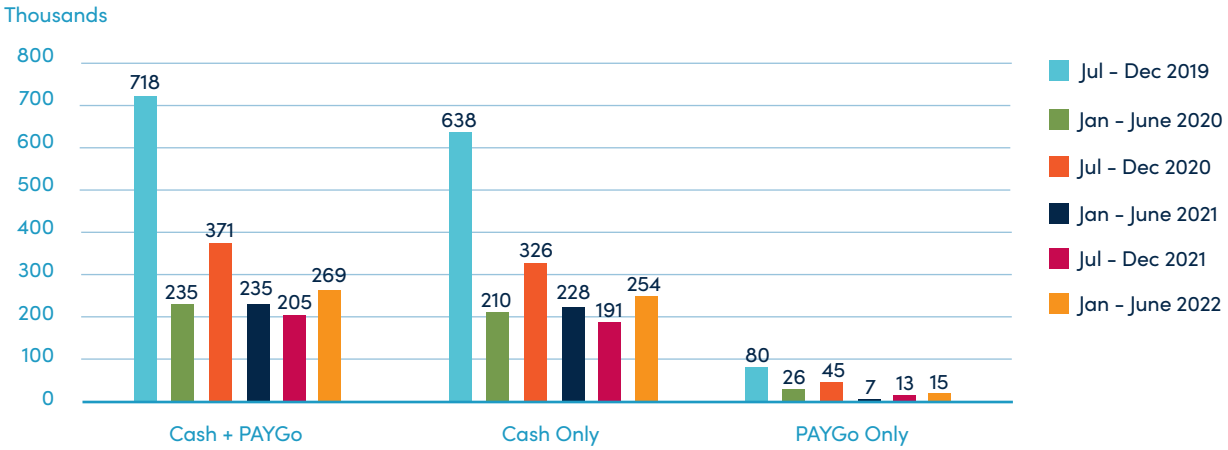
Off-Grid solar energy kits

With 268,000 units sold this round, sales in Ethiopia have increased by 31% compared to the second half of 2021. However, it should be noted a large share of sales for this round can be directly attributed to humanitarian bulk procurement. Given this report does not systematically track humanitarian sales, this cannot be reliably compared to previous rounds. However, given the continued challenges of companies' access to foreign exchange for the importation of products, and the ongoing humanitarian crisis in parts of the country, it is safe to assume that sales were mostly driven through bulk procurement by the humanitarian sector. Solar lanterns make up 95% of all units sold this reporting round.

Products reported as PAYGo in this report are PAYGo enabled, but there is considerable evidence that in Ethiopia, these PAYGo-enabled products are often not sold PAYGo. PAYGo numbers presented below are therefore likely overestimated.

Reported sales of appliances in Ethiopia are negligible. 162 key appliances were reported sold this round. Too few companies reported data to provide any other insights in this report. Low appliance sales can be linked to limited SHS sales in Ethiopia and low PAYGo penetration.

Figure 18 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits – Ethiopia



26 UNHCR, Global Trends Forced Displacement in 2021, 2022.
27 Bloomberg, Ethiopia's Inflation Rate Drops For First Time in Four Months, 2022.
28 Ethiopian Ministry of Water, Irrigation & Electricity (2019), National Electrification Program 2.0. Integrated Planning for Universal Access.

East Africa Insights

Tanzania Insights

Background

Tanzania's economy saw positive recovery signs in 2021 and 2022, although the government recently lowered its projections for annual growth.[29] The government also announced the construction of three hydroelectric plants with a total 2,695 megawatts of installed capacity. Feedback from the field points to increased fuel costs impacting the off-grid supply chain and operational costs of off-grid solar companies.

Sales Trends

Off-Grid solar energy kits

Sales of solar energy kits in the first half of 2022 reached 112,000 units, a 31% decrease compared to the second half of 2021. Although both cash and PAYGo sales have decreased, cash sales have significantly fallen over the last year from almost 100,000 units in the first half of 2021 to just 15,000 units this round.

Appliances

Like in many other East African countries, most appliance sales reported in Tanzania are TVs (97%) and sold bundled with PAYGO kits (97%). The increase in SHS sales is mainly for smaller SHS which may explain why the increase in SHS sales has so far not translated into an increase in TV sales. With 12,485 TVs sold, sales have decreased by 18% compared to the second half of 2021 and 28% compared to the first half.

Although fans, RUs and SWPs sales were reported, there were not enough companies sharing data this round to publicly share the numbers.

Figure 20 - Semi-annual Evolution of Sales Volumes of Key Appliances - Tanzania

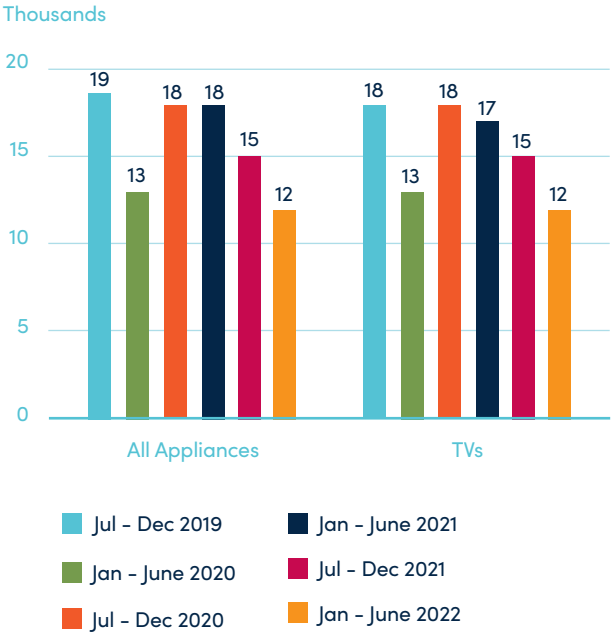
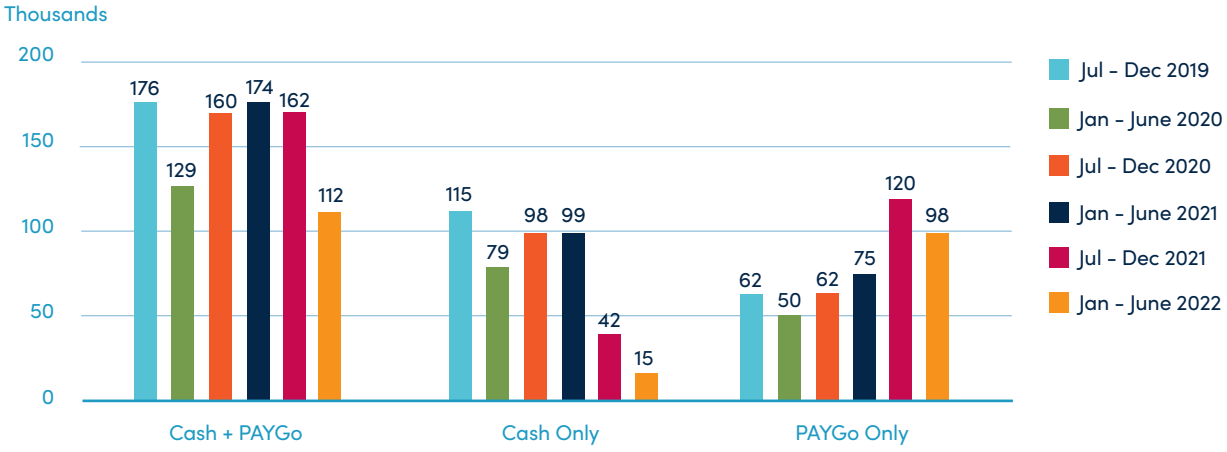


Figure 19 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits – Tanzania



29 Reuters, Tanzania forecasts slower GDP growth in 2022, expects pick-up next year, 2022.

East Africa Insights

Zambia Insights

Background

Recent projections placed Zambia on a slow track to recovery in 2022 with 3.1% annual GDP growth. Insights from industry stakeholders indicate that companies in the sector have benefited from a strengthened Zambian Kwacha, decreased inflation, and an above average harvest. Additionally, companies report a more consistent application of the import duty and VAT waivers.

In the off-grid sector, Zambia receives continued support from the Beyond the Grid Fund for Africa with $10 million in funding from Germany and Sweden until 2025.

Sales Trends

Off-Grid solar energy kits

Sales of Solar energy kits reached 216,000 units in the first half of 2022, a 44% increase compared to the second half of 2021. Volumes reported have grown by almost 400% since the first half of 2020 when the Zambian economy shrank due to the COVID-19 pandemic.

The main driver has been a strong increase in the sales of solar lanterns, notable in the 0-1.5Wp category. In the second half of 2019, before the COVID-19 pandemic, 38% of products sold were lanterns. In the first half of 2022, 76% are lanterns.

Appliances

With 3,525 units of key appliances sold this reporting round, Zambia records a 62% decrease in sales compared to the previous reporting round. 90% of units sold are TVs.

There were also 116 RUs sold in the first half of 2022 in Zambia. It's the first time enough companies report RU sales in Zambia for the data to be published.

Figure 22 - Semi-annual Evolution of Sales Volumes of Key Appliances – Zambia

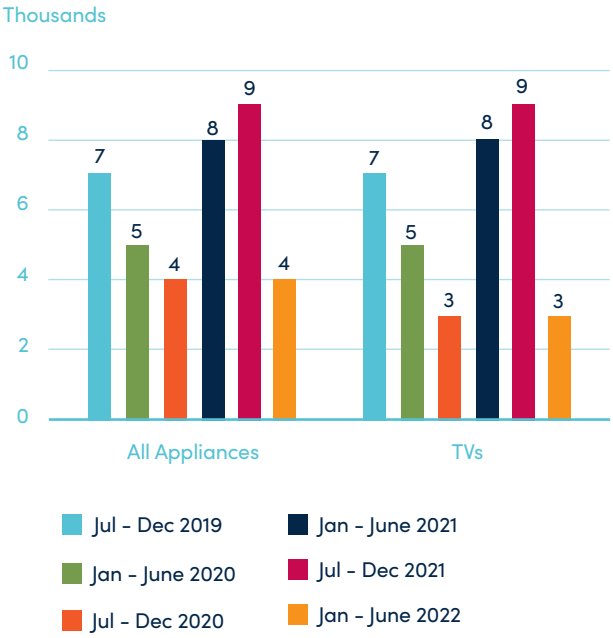
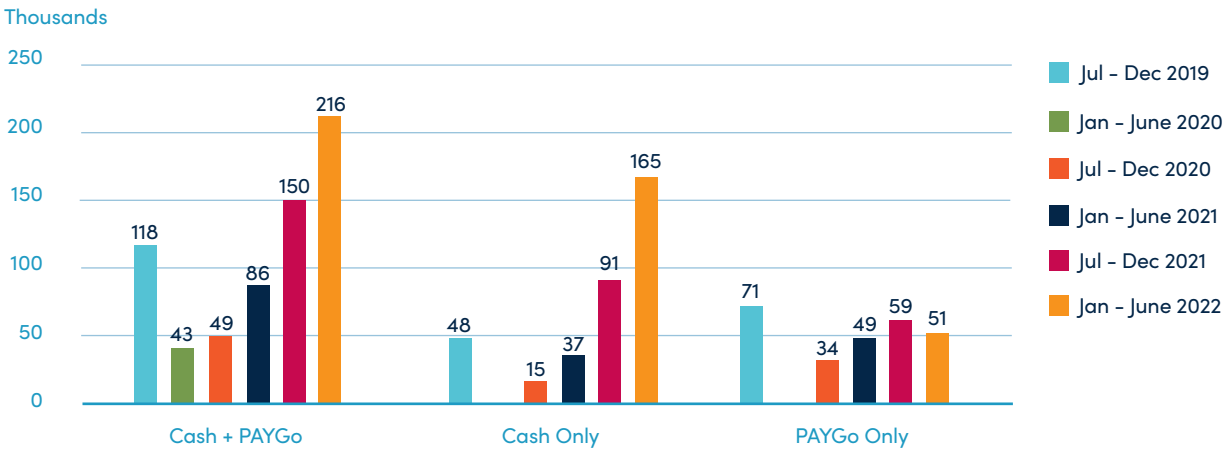


Figure 21 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits – Zambia



East Africa Insights

Other East African Countries

Madagascar

Sales of off-grid solar products reached 63,000 units in the first half of 2022, a 6% increase compared to the second half of 2021. Sales are 91% higher than in the first half of 2021. This is significant, as Madagascar has previously displayed seasonal trends with significantly lower sales in the first half of the year. It could indicate either an acceleration in the growth of sales or a change of sales patterns. Cash sales decreased by 11% compared to the second half of 2021 while PAYGo sales grew by 28%.

4,222 key appliances were sold during the first half of 2022, a marked increase from 1,348 units sold during the second half of 2021. The most common appliance are TVs. Sales also include fans, RUs and SWPs. Due to a low number of reporting companies and limited historical data, no further details can be provided regarding the appliance sales in Madagascar.

On-going initiatives supporting the sector in Madagascar that have been reported to us include:

- The $40 million Off-Grid Market Development Fund (OMDF), offering RBF and debt funding, by the Government of Madagascar, funded by the World Bank and implemented by Bamboo Capital Partners is currently playing a significant role in boosting off-grid energy access in Madagascar. The fund has attracted new market players and led more distributors to focus on high-quality Verosol-certified products.

Malawi

The duty and excise taxes on solar lamps and solar fridges have been waived by the government in February 2022. Companies operating in Malawi have already been able to benefit from its implementation. However, they have also been affected by the 25% devaluation of the Kwacha and foreign exchange issues are also leading to fuel shortages which are limiting the ability of companies to operate.

Like Madagascar, Malawi has seen strong seasonal variations in sales reported, but is following a clear growing trend on an annual basis. However, effects of the changing economic context may be felt in future rounds. **With 74,000 units sold this round, sales in Malawi decreased by 37% compared to the second half of 2021.** However, sales are 63% higher than during the first half of 2021. Both cash and PAYGo sales are lower than during the second half of 2021. While cash sales are indeed higher this round than in January-June 2021, the same cannot be said for PAYGo sales volumes.

Not enough companies reported sales of appliances during the first half of 2022 to share any data. In the second half of 2021, close to 2,000 units had been reported, the vast majority of which being TVs.

Mozambique

Mozambique has also been hit by double digit inflation rates in the first half of 2022 which is affecting customers' payment capacity. There are also concerns that the violence in the Cabo Delgado province may be spilling over to neighboring provinces and affecting their security.

Mozambique is another East African market that has experienced a strong growth trend over the past few years, with seasonal variations. Sales are typically lower in the first half of the year. **With 56,000 solar energy kits sold, sales for the first half of 2022 are 26% lower than in the second half of 2021 and 80% higher than in the first half of 2021.** The decrease in sales volume is driven by lower sales of cash products while PAYGo sales grew by 7% compared to the previous reporting round.

Similarly, appliance sales decreased by 57% compared to the previous reporting round with close to 1,300 units, but that is 3% higher than during the first half of 2021. 95% of units sold are TVs.

On-going initiatives supporting the sector in Mozambique that have been reported to us include:

- The BRILHO program financed by the FCDO and Sweden, and implemented by SNV has been running since 2019 providing funding (catalytic grants and RBF) and technical assistance to kick-start businesses in the off-grid sector (SHS, clean cooking and mini-grids).

East Africa Insights

Other East African Countries

- Support from the Fundo de Acesso Sustentavel as Energias Renovaveis's (FASER) RBF set up by the Fundação para o Desenvolvimento da Comunidade (FDC) and GIZ, through the Energizing Development (EnDev) and Grüne Bürgerenergie (GBE) programs.

Rwanda

On-going initiatives supporting the sector that have been reported to us include:

- In 2020, the World Bank approved a $150 milllion IDA loan to the Government of Rwanda to improve access to modern energy, of which $15 million are allocated towards the pro-poor RBF for off-grid solar, complementing $15 million previously allocated to support off-grid solar through the REF. Under the pro-poor RBF (REF window 5), the government is subsidizing low-income households' access to solar home systems. As of August 2022, the RBF had recorded 150,000 units sold.
- The Development Bank of Rwanda (BRD) launched a CanaChallenge which campaigns for private entities and individuals to donate to help provide vulnerable Rwandans with access to energy. For every 15,000 RWF pledged, the BRD will pledge 100,000 RWF.

With 157,000 units sold, off-grid solar energy kits sales in Rwanda increased 13% compared to the second half of 2021. Cash and PAYGo sales both grew at a similar rate compared to the second half of 2021. PAYGo sales decreased by 9% compared to the previous reporting round while cash sales increased by 33%.

5,400 key appliances were sold in Rwanda during the first half of 2022, which is a 26% increase compared to the second half of 2021. Almost 100% of these sales come from TVs.

Uganda

Sales of Solar energy kits reached 123,000 units during the first half of 2022, a 19% decrease compared to the second half of 2021, but 11% higher than during the first half of 2021. This is a positive signal as it is the second round of year-on-year growth after sales in July-December 2021 exceeded sales for the same period in 2020.

This round, low appliances sales were reported in Uganda, with just 1,858 units sold including 931 TVs, 826 SWPs and 87 RUs. Among affiliates, Uganda has consistently been one of the largest markets for SWPs. Sales were 79% lower than in the second half of 2021 and 68% than during the first of 2021.

Current and upcoming interventions supporting the sector in Uganda include:

- Uganda is one of the countries targeted by the €8 million Sustainable Energy for Smallholder Farmers project alongside Ethiopia and Kenya. The project is funded by EnDev and the Ikea Foundation and aims to support PUE in dairy and horticultural value chains.
- The Beyond the Grid Fund for Africa – Uganda, funded by Denmark and Sweden and implemented by NEFCO and REEEP. 20.7 million in RBF are available and the program will run until 2026.
- In Spring 2022, the World Bank approved the $400 million Uganda Energy Access Scale-up Project (EASP) to support on- and off-grid electrification in Uganda as well as access to clean cooking. Disbursement has not yet begun.

West Africa Insights

West Africa Insights

Regional Sales Trends

Off-Grid Solar energy kits

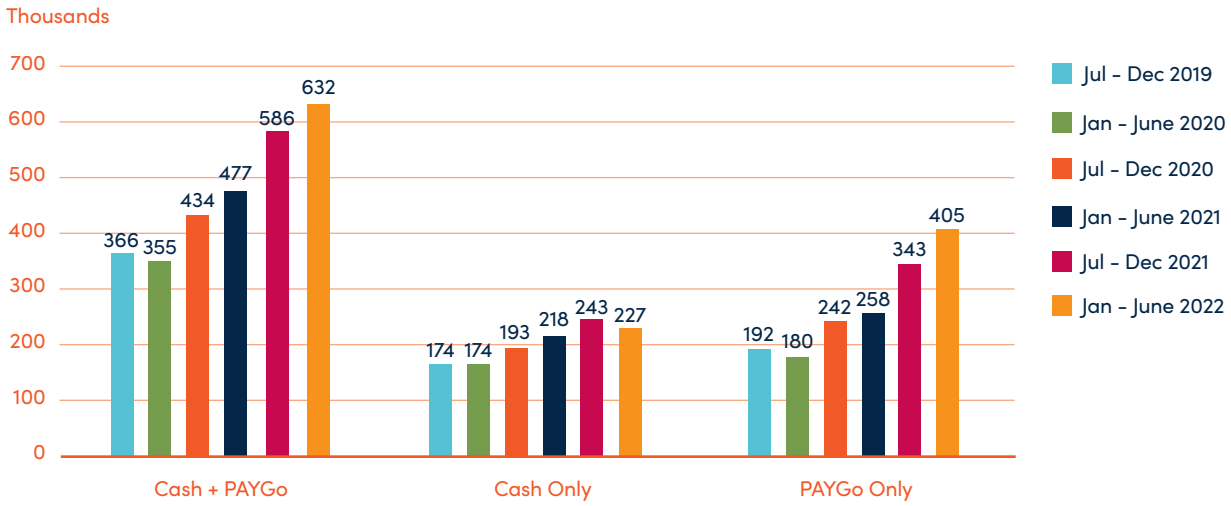
Sales of off-grid solar energy kits in West Africa between January and June 2022 reached 632,000 units. This is an 8% increase compared to the second half of 2021 and a 33% increase compared to the first half of 2021.

For the first time since 2020, cash sales decreased by 6% compared to the second half of 2021 reaching 227,000. The PAYGo segment remained on a robust growth trajectory increasing by 18% over the same period reaching almost 405,000 units sold.

Product Trends

Sales per product category show a mixed picture. Lantern sales decreased by 7% compared to the second half of 2021, MLS grew by 25% and SHS by 13%. Within the SHS segment, 11-20Wp and 50-100Wp SHS have seen continuous growth over the past year.

Figure 23 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits - West Africa



NOTE:
Products are classified as 'Cash' when sold in a single transaction (including products purchased via tenders), or as 'PAYGo', when the customer pays for the product in installments over time or pays for use of the product as a service.

Table 6 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits by Category - West Africa

Categories		Jan-Jun 2022 volumes Solar Energy Kits (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021	Share of PAYGo
Lanterns	0-1.5Wp	**164,297**	1%	23%	0%
	1.5-3Wp	**48,040**	-27%	-41%	10%
Multi-light systems	3-10Wp	**154,168**	25%	31%	90%
Solar Home Systems	11-20Wp	**117,441**	19%	143%	-
	21-49Wp	**28,222**	-30%	4%	100%
	50-100Wp	**106,838**	31%	92%	95%
	100+Wp	**13,072**	-9%	15%	-

West Africa Insights

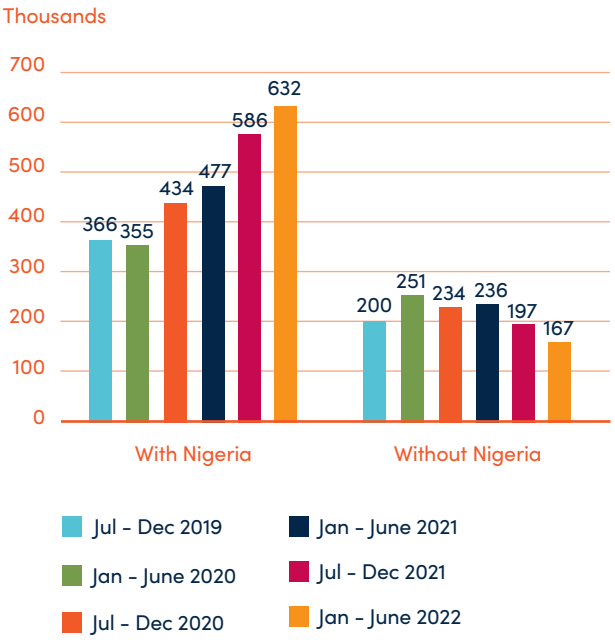
Countries Overview

As in previous rounds, positive trends in West Africa are mainly representative of Nigeria with few other markets showing consistent growth. With 465,000 units sold, Nigeria represents 74% of sales recorded in the region. The table and chart below show the recent sales trends and illustrate the divide between Nigeria and most of the region.

Off-grid solar appliances

Sales of key appliances in West Africa in the first half of 2022 reached 152,000 units. This is a 60% increase compared to the second half of 2021. Appliance sales in West Africa account for 56% of Sub-Saharan Africa sales and, for the first time, exceed appliance sales in East Africa.

Figure 24 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits - West Africa with and without Nigeria



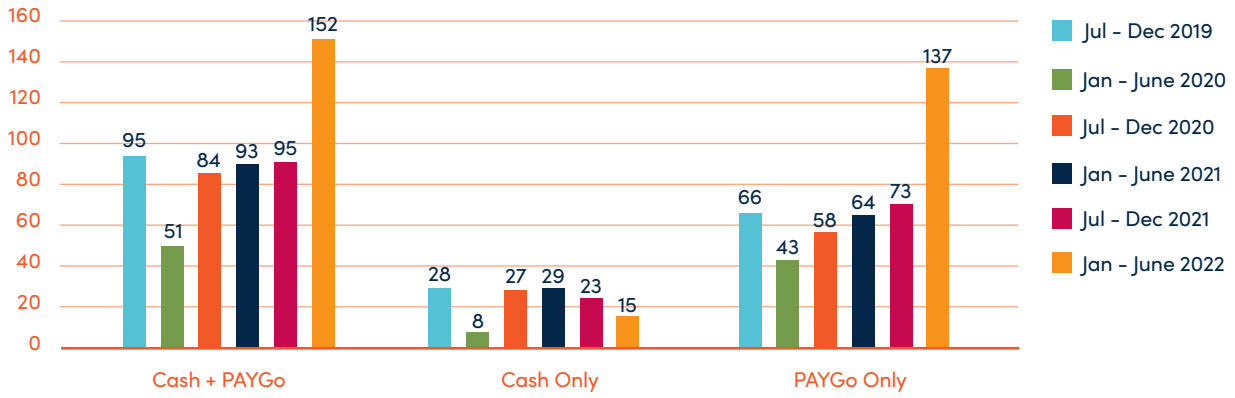
NOTE:
Countries not featured in this table did not see enough companies reporting to pass the three-data point rule.

Table 7 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits by Country - West Africa

Region / Countries	Jan-Jun 2022 volumes Solar Energy Kits (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021
West Africa	**632,078**	**8%**	**33%**
Nigeria	464,943	20%	94%
Benin	41,044	7%	25%
Togo	27,671	-16%	-6%
Burkina Faso	21,570	-48%	-51%
Sierra Leone	17,842	151%	-54%
Senegal	15,626	-38%	-58%
Cote d'Ivoire	14,935	21%	-22%
Guinea	14,154	50%	
Mali	8,523	-30%	-60%
Liberia	2,622		-61%
Ghana	2,613	-53%	-47%

West Africa Insights

Figure 25 - Semi-annual Evolution of Sales Volumes of Key Appliances - West Africa



Product Trends

West Africa is the second largest regional market worldwide for TVs after East Africa. It is also the second largest regional worldwide market for fans, after South Asia.

TV sales in the region grew by 25% compared to the second half of 2021. 99% of TVs were sold bundled with a SHS. Large TVs (24"-29") remain the most popular, accounting for 55% of total units sold. Extra-large TVs (30"+) record the second highest volumes, accounting for 43% of all products sold, while medium TVs and small TVs represent just 2% of units sold. In the past, the region had reported significant sales of smaller TVs and now appears to be following the same trend in TV size sales as in East Africa.

79,000 fans were sold in West Africa this round, a 119% increase on the second half of 2021. This is particularly noteworthy, as fan sales in West Africa had typically been higher in the second half of the year in recent years. 80% of units are sold bundled with a power system, generally an SHS. The vast majority of sales are to Nigeria.

Refrigeration unit sales grew by 14% to 1,239 units sold while SWP sales dipped by 8% to 1,114 units sold.

Table 8 - Semi-annual Evolution of Sales Volumes of Key Appliances by Type - West Africa

Appliance	Jan-Jun 2022 volumes Key appliances (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021	Share reported as sold PAYGo	Share sold bundled with a power system
TVs	**71,035**	25%	26%	93%	99%
Fans	**78,921**	119%	128%	66%	80%
RUs	**1,239**	14%	-18%	-	-
SWPs	**1,114**	-8%		-	-

West Africa Insights

Countries Overview

Nigeria is by far the largest appliance market in the region and strong growth in Nigeria hides more nuanced trends in other markets in the region.

Table 9 - Semi-annual Evolution of Sales Volumes of Key Appliances by Country - West Africa

Region / Countries	Jan-Jun 2022 volumes Key appliances (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021
West Africa	**152,309**	**60%**	**64%**
Nigeria	103,375	168%	316%
Benin	14,979	29%	24%
Senegal	10,578	2%	-27%
Guinea	6,833		214%
Cote d'Ivoire	5,230	-42%	-56%
Burkina Faso	1,792	227%	20%
Mali	1,446	-57%	-60%

NOTE:

- The category 'Key Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units.
- Products are classified as 'Cash' when sold in a single transaction (including products purchased via tenders), or as 'PAYGo', when the customer pays for the product in installments over time or pays for use of the product as a service.
- Countries not featured in this table did not see enough companies reporting to pass the three-data point rule.

West Africa Insights

Nigeria Insights

Background

Nigeria returned to growth in 2021 and is predicted to grow 3.4% in 2022. However, the country is also contending with high inflation driven by rising food prices, diesel prices and gas prices as well as supply chain disruptions. In May 2022, inflation reached 17.7%.[30] Companies have also highlighted access to foreign exchange has become increasingly challenging during the first half of 2022.

The Nigeria Electrification Program (NEP), which is carried out by the Rural Electrification Agency with funding from the World Bank and the African Development Bank aims to provide electricity access, through mini grids and stand-alone off-grid solutions and to accelerate the proliferation of productive appliances for off-grid communities.[31] In particular, it includes a $75 million RBF facility[32] for solar energy kits which has led to 336,000 connections since it started.

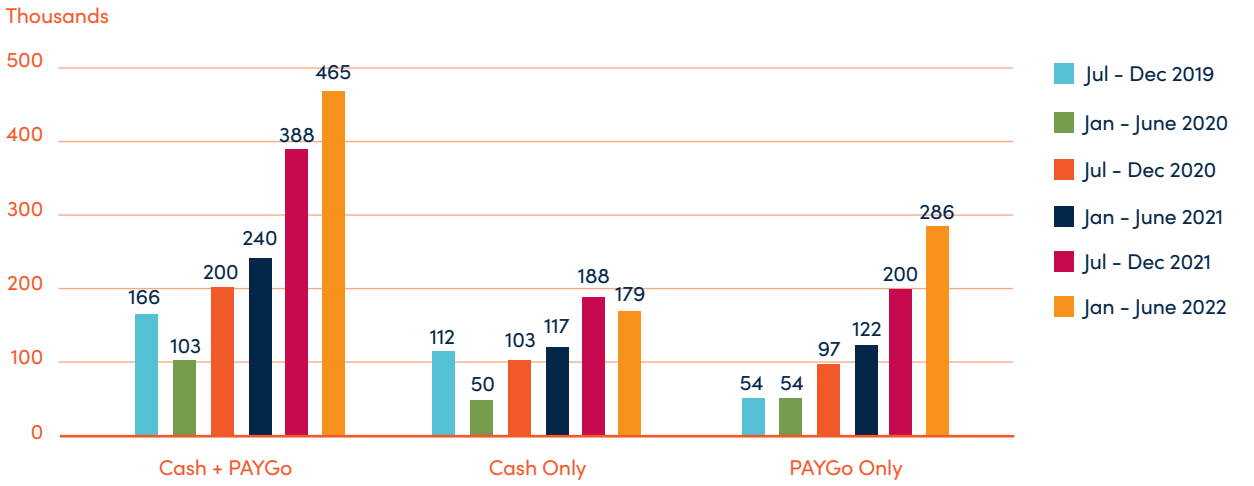
The Solar Power Naija Program (SPN) was announced in December 2020 and aims to electrify 5 million households, serving about 25 million Nigerians, through SHS and mini-grids, under the Economic Sustainability Plan.[33] In the first half of 2022, the Nigeria Sovereign Investment Authority (NSIA) provided $24 million in financing for the program which is to fund the assembly and deployment of 200,000 SHS.[34]

Sales Trends

Off-Grid solar energy kits

Nigeria represents 74% of West African sales. **Nigeria has again recorded particularly high sales volumes this reporting round reaching 465,000 units. This is a 20% increase on the second half of 2021 and a 94% increase compared to the first half of 2021.** However, while PAYGO sales continue to grow at a fast pace(43%), cash sales decreased (-5%) for the first time since the first half of 2020. The strongest relative increase in sales compared to the second half of 2021 is for SHS ranging 50-100Wp (+135%), followed by 21-49Wp (+56%), 11-20Wp (+30%) and multi-light systems (+24%).

Figure 26 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits – Nigeria



30 IMF, IMF Staff Concludes Staff Visit with Nigeria, 2022.
31 More information on the NEP here.
32 Efficiency for Access Coalition (2021), Off- and Weak-Grid Appliance Market: Nigeria.
33 REA (2020), Fg Launches 'Solar Power Naija' A 5 Million Solar Connection Programme To Off Grid Communities.
34 Africa Energy Portal, NSIA To Provide $24m for Solar Power Naija Programme, 2022.

West Africa Insights

Nigeria Insights

Appliances

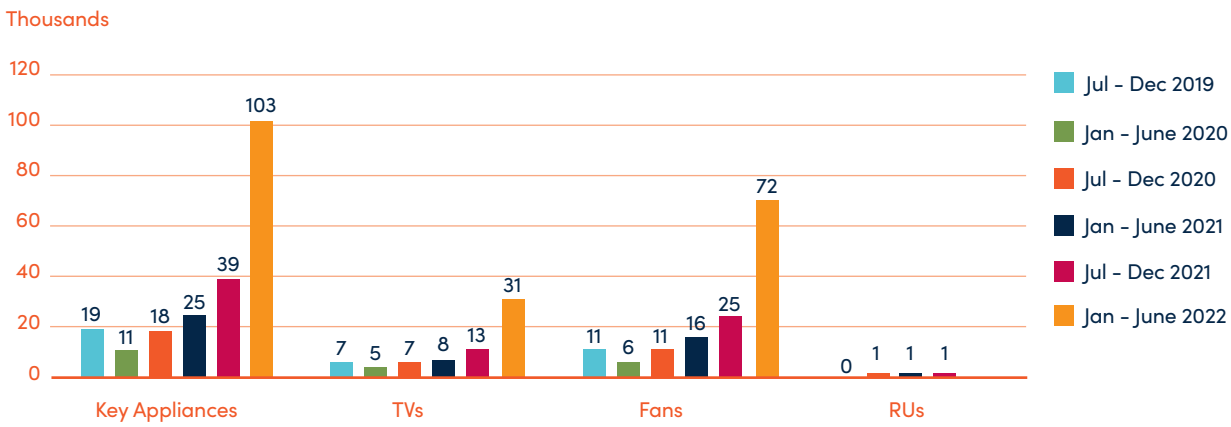
For the second data collection round in a row, Nigeria records its highest ever half year appliance sales. Sales for the first half of 2022 are 168% higher than in the second half of 2021 and 316% higher than in the first half of 2021.

TV sales experienced a 130% increase compared to the previous reporting round to reach 31,000 units sold. Almost all are bundled with an SHS. Due to the insufficient number of companies reporting small and medium TVs, detailed data on sales by TV size cannot be shared. However, almost all TVs sold are either large (24"-29") or extra-large (30+"), with extra-large TVs being the most popular.

Fans recorded a 193% increase reaching 72,000 units sold for the first half of 2022. 80% of units were sold as part of a SHS. Due to the limited number of companies reporting sales of specific fan types, detailed data on sales per fan category cannot be shared in this report. It can however be shared that the majority are pedestal fans. Table fans also recorded sales, while no ceiling fan sales were reported.

Too few companies reported sales of RUs or SWPs to share additional insights about sales of these appliances.

Figure 27 - Semi-annual Evolution of Sales Volumes of Key Appliances - Nigeria



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West Africa Insights

Benin Insights

Background

Benin's economy is expected to grow by 6.1% in 2022.[35] This is partly linked to positive reforms in agricultural governance that have accelerated the country's agricultural output growth and also helped the country manage inflation, which reached 2.3% in June 2022, the lowest for any West African Economic and monetary Union (WAEMU).[36]

In 2017, the Benin Power Compact from the Millennium Challenge Corporation (MCC) entered into force. Out of a total grant of $391 million, approx. $45 million are budgeted for the Off-Grid Electricity Access Project which supports mini-grid and SHS deployment.

Other initiatives supporting the sector in Benin include a 2019-2021 RBF window from EnDev for solar energy kits and a productive use RBF from Green People's Energy (GBE) for Africa – Benin. The RBF from EnDev included up to €1.3 million for distribution of solar energy kits. The RBF by GBE includes 350,000 EUR for PUE companies and €150,000 to companies that provide credit for PUE customers.[37] Calls for expressions of interest were due to close in summer 2022.

Sales Trends

Off-Grid solar energy kits

Solar energy kit sales for the first half of 2022 reached 41,000 units, a 7% increase on the second half of 2021. Most products sold in Benin are sold PAYGo. This is particularly noticeable this round as cash sales decreased by 81% to 1,000 units sold, while PAYGo sales grew by a further 21% to 40,000 units.

Appliances

Appliances sales in Benin for the first half of 2022 reached close to 15,000 units. This is a 29% increase compared to the second half of 2021. 91% of units sold are TVs. Too few companies reported appliance sales in Benin for further details to be shared, but fans, RUs and SWPs were also reported.

Figure 29 - Semi-annual Evolution of Sales Volumes of Key Appliances – Benin

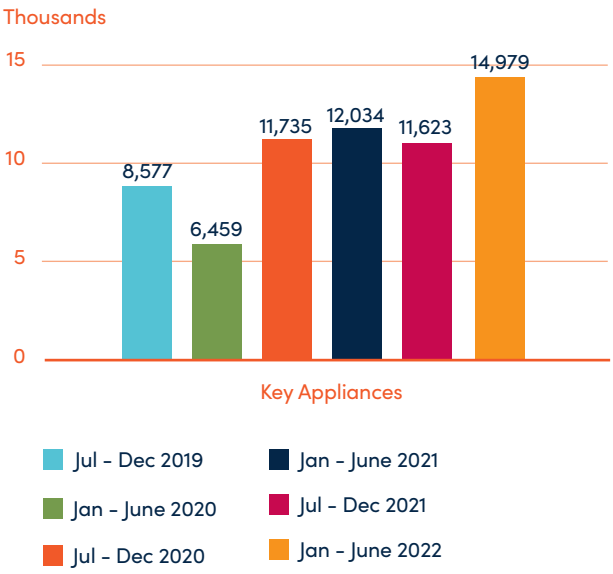
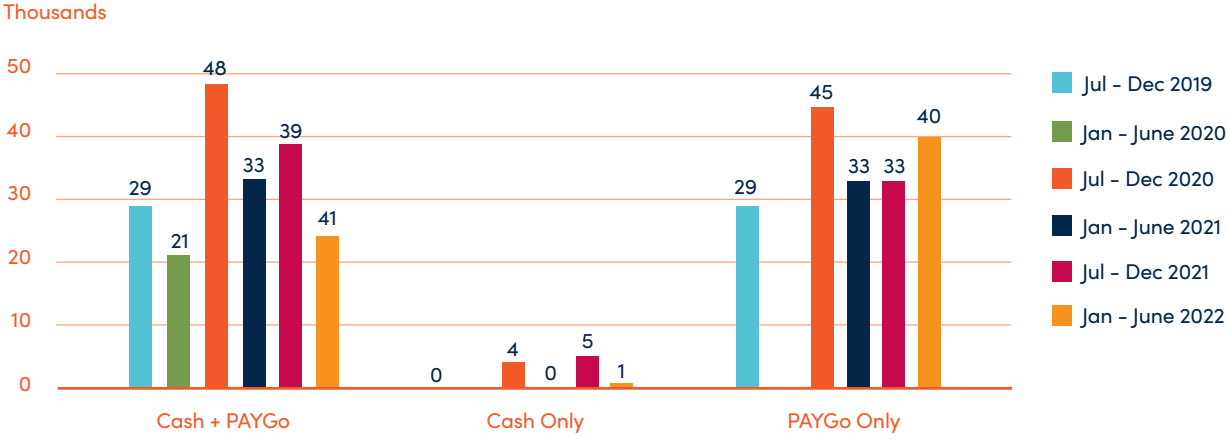


Figure 28 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits – Benin



35 African Development Bank Group, Benin Economic Outlook, 2022.
36 24h au Benin, 2,3% de taux d'inflation en juin 2022 au Bénin, 2022.
37 More information here.

West Africa Insights

Other West African Countries

Burkina Faso

22,000 units of solar energy kits were sold by manufacturers during the first half of 2022. This is a 48% decrease compared to the second half of 2021 and 51% lower than during the first half of 2021. 80% of sales reported between January and June 2022 are reported as cash sales. Political instability and security issues have made it challenging for companies to operate in Burkina Faso. Though sales over time have seldom followed clearly observable trends.

In the first half of 2022, close to 1,800 units were sold including close to 1,200 TVs and 500 fans. Just over 500 units of key appliances had been sold in the second half of 2021. RU and SWP sales were also reported, but due to an insufficient number of companies reporting, data for the results cannot be shared in this report.

Interventions currently supporting the sector in Burkina Faso include the Beyond the Grid Fund for Africa signed its first project in April 2022 to support the deployment of SHS in the country.

Côte d'Ivoire

Sales for the first half of 2022 increased by 21% to almost 15,000 units. Reported sales of off-grid solar energy kits fell to 12,000 units during the second half of 2021. This is due to a combination of market dynamics and lower participation. Feedback from sector stakeholders highlights that the sector has been negatively impacted by high inflation, especially high fuel prices. However, there has been some additional interest in solar home systems as a replacement for generators.

Key appliance sales in Cote d'Ivoire have been on a quasi-constant declining trend since the end of 2019. In 2019, close to 25,000 units per half-year were reported. **In the first half of 2022, this number has fallen to just 5,200 units sold, almost all of which are TVs.**

Guinea

14,000 units of solar energy kits were sold in Guinea during the first half of 2022, a 50% increase on the second half of 2021. 36% of units sold were lanterns while the rest were all SHS. Sales reported in the country have started growing since 2020. Further data collection rounds are needed to assess if this is a continuing trend.

Close to 7,000 appliance sales were reported for the first half of 2022. Due to the limited number of companies reporting in 2021, exact growth data cannot be shared, but sales have followed similar growth to that of solar energy kit sales. Almost all units sold are TVs, whilst some fan sales were also reported.

Senegal

Sales of Solar energy kits reached 16,000 units between January and June 2022. This is a 38% decrease on the previous reporting round and 58% lower than the peak in sales reported in the first half of 2021.

Just over 10,500 key appliances were sold in the first half of 2022. This is a 2% increase on the previous reporting round, but 27% lower than the highest appliance sales recorded for a half year in Senegal in the first half of 2021.

TV sales increased by 25% to over 6,000 units. All TVs sold were bundled with a SHS. This can be correlated to growth of 50-100Wp SHS sales.

Interventions currently supporting the sector in Senegal include:

- The VAT exemption for solar products came into effect in December 2020. The measure aimed to reduce the acquisition cost of renewable production equipment by 18%. Anecdotal evidence indicates companies had initially been able to benefit from the exemption.

West Africa Insights

Other West African Countries

Sierra Leone

Solar energy kit sales in the second half of 2021 fell to 7,100 units from 39,000 units the previous round. **Between January and June 2022, close to 18,000 units were sold.** Further data collection is needed to understand if this is a return to growth or part of a seasonal pattern.

Too few companies shared appliance sales data to include numbers in this report. Sales reported include both TVs and fans.

Togo

Off-grid Solar energy kit sales in the first half of 2022 reached close to 28,000 units, a 16% decrease on the previous reporting round, and 6% lower than in the first half of 2021. The vast majority of sales reported this round were PAYGo sales. Further data collection is needed to confirm indications that this is tied to seasonal fluctuation in cash sales, with manufacturers reporting significantly higher sales to the country in the second half of the year.

Too few companies shared appliance sales data to include numbers in this report. Sales reported include both TVs and SWPs.

Ongoing initiatives supporting the sector in Togo that have been reported to us include:

- Since 2017, the CIZO rural electrification program has worked to create an enabling environment for the access to energy sector and especially PAYGo SHS providers. In particular, the customer subsidy program often referred to as "CIZO cheque" introduced in 2019,[38] in which the customer pays only the unsubsidized portion of their monthly PAYGo fee out-of-pocket, has been hailed as a success. Furthermore, the CIZO program's subsidy scheme was extended in 2021 to solar water pumps[39] with a target to distribute 3,000 pump.[40]

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38 République Togolaise, The government launches the "CIZO solar check" to support households in the energy transition.
39 PV Magazine, EDF s'investit au Togo dans l'irrigation solaire pour les agriculteurs.
40 Togo First, Cizo: Solar-powered irrigation pumps to be set up in rural areas.

Central Africa Insights

Central Africa Insights

Regional Sales Trends

Off-Grid solar energy kits

Sales of off-grid solar products in Central Africa decreased by 44% to 134,000 units sold. This follows a peak in sales in the second half of 2021 which was in part linked to growth in Cameroon and DRC, but also bulk purchasing of small solar lanterns. Cash sales decreased by 36% while PAYGo sales decreased by 63%.

Product Trends

All product categories are affected by the lower sales. Small portable lanterns (0-1.5Wp) recorded the largest drop in absolute terms from 152,000 units to 86,000 units, while multi-light systems recorded the largest relative drop in sales with -58%. Seasonal patterns may also be at play, but irregular patterns in sales reported make it hard to assess from the data.

Figure 30 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits - Central Africa

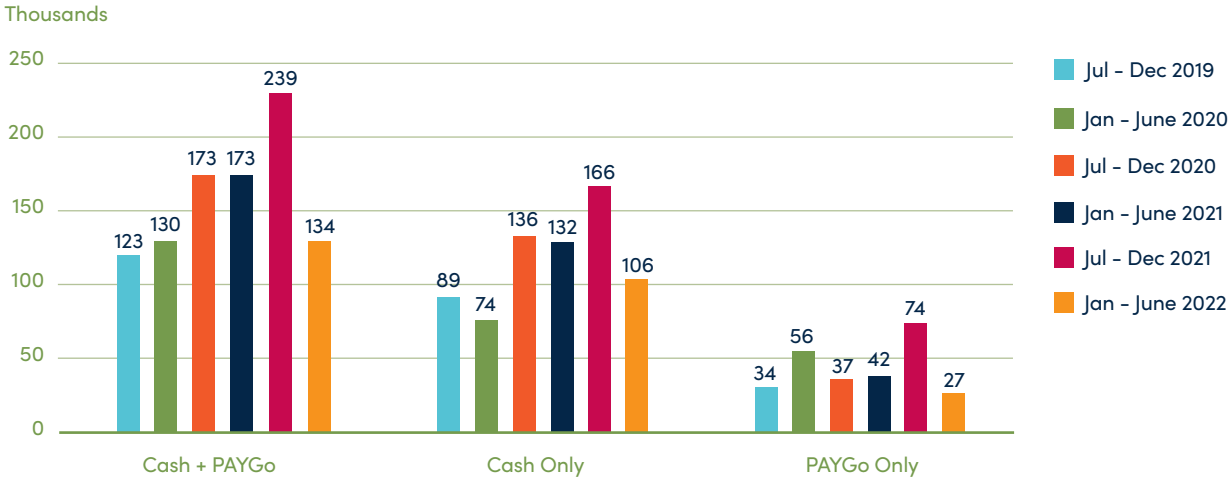

Table 10 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits by Category – Central Africa[41]

Categories		Jan-Jun 2022 volumes Solar Energy Kits (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021	Share of PAYGo
Lanterns	0-1.5Wp	**85,653**	-44%	153%	0%
	1.5-3Wp	**18,696**	-32%	-83%	14%
Multi-light systems	3-10Wp	**8,583**	-58%	307%	-
Solar Home Systems	11-20Wp	**7,656**	-49%	-24%	100%
	21-49Wp	-			-
	50-100Wp	**13,170**	-38%	-10%	-
	100+Wp	-			-

41 Product reclassification means data from 2021 H2 for solar lanterns is no longer directly comparable with data from 2020 H1, H2 and 2021 H2. While this affects multiple markets, the impact is minimal except in Central Africa.

Central Africa Insights

Countries Overview

Both Cameroon and DRC record a sharp decrease in sales. In the case of Cameroon, this can be partly linked to particularly high lantern sales to the country in the second half of 2021.

Off-grid solar appliances

95% of sales of appliances reported in the region are from DRC. 99% of units sold between January and June 2022 are TVs. Sales of fans and RUs were also reported. Key appliance sales in the region are 48% lower than in the first half of 2021 and 18% lower than in the first half of 2021.

Figure 31 - Semi-annual Evolution of Sales Volumes of Key Appliances – Central Africa

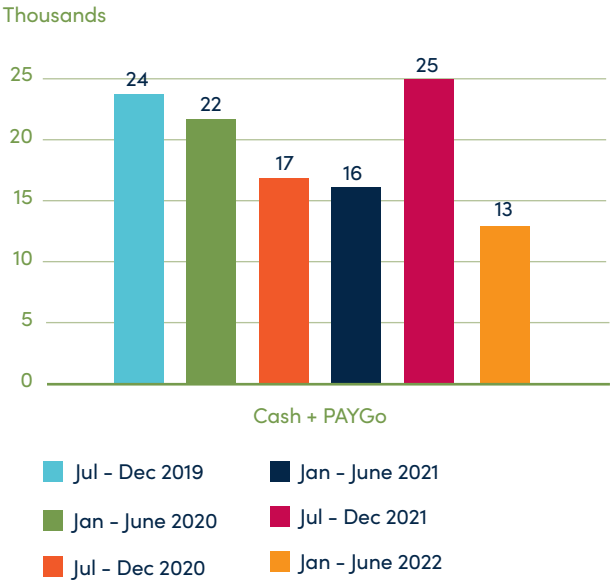

Table 11 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits by Country – Central Africa

Region / Countries	Jan-Jun 2022 volumes Solar Energy Kits (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021
Central Africa	**133,798**	**-44%**	**-23%**
Cameroon	89,398	-44%	-18%
Democratic Republic of Congo	22,585	-68%	-46%

NOTE:
Countries not featured in this table did not see enough companies reporting to pass the three-data point rule.

Central Africa Insights

Central African Countries

Cameroon

Sales of solar energy kits in Cameroon decreased by 44% compared to the second half of 2021 to 89,000 units. This is mostly driven by much lower sales of solar lanterns (0-1.5Wp) which decreased by 53% to 69,000 units.

Very few companies reported appliance data in Cameroon, with 604 units of key appliances including TVs, fans and RUs were reported this round.

Democratic Republic of the Congo

Access to energy in DRC is currently supported by the World Bank's DRC Electricity Access and Services Expansion (EASE) program, which includes an active $3.5 million RBF that has supported sales of 28,000 solar energy kits since it first started. The Beyond the Grid Fund for Africa has also opened its first call for proposals in DRC.

22,500 solar energy kits were sold during the first half of 2022, a 68% decrease in sales compared to the first half of the year and a 46% decrease compared to the first half of 2021. 84% of units sold were sold through PAYGo. The decrease in sales affected lanterns and SHS while multi-light system sales grew.

Close to 12,000 units of key appliances were sold in DRC in the first half of 2022, a 49% decrease compared to the second half of 2022. 99% of units sold are TVs. The remaining appliances include fans and RUs.

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South
Asia
Insights

South Asia Insights

Regional Sales Trends

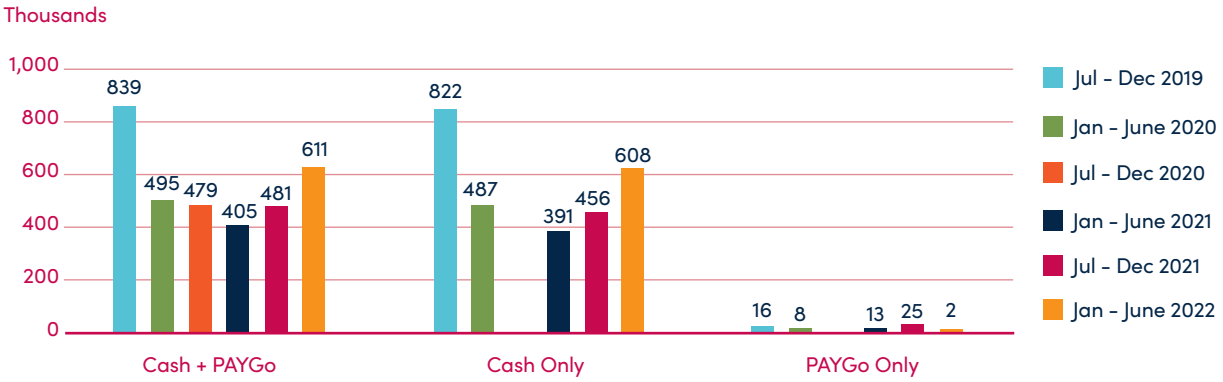
Off-Grid solar energy kits

Sales of off-grid solar energy kits in South Asia have increased by 27% compared to the second half of 2021 to reach 611,000 units sold. Cash sales grew by 33% while PAYGo sales dropped by 90% to just below 2,500 units.

Product Trends

Sales in South Asia are predominantly driven by solar lanterns representing 85% of all volumes this round, and cash sales which account for more than 99%. Key markets like India and Bangladesh have seen their product mix progressively evolving from traditional off-grid solutions towards weak-grid or component-based products.

Figure 32 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits – South Asia



NOTE:
Products are classified as 'Cash' when sold in a single transaction (including products purchased via tenders), or as 'PAYGo', when the customer pays for the product in installments over time or pays for use of the product as a service.

Table 12 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits by Category – South Asia

Categories		Jan-Jun 2022 volumes Solar Energy Kits (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021
Lanterns	0-1.5Wp	**161,474**	-26%	6%
	1.5-3Wp	**356,254**	85%	199%
Multi-light systems	3-10Wp	**88,622**	64%	32%
Solar Home Systems	11-20Wp	**4,398**		-87%
	21-49Wp	-		
	50-100Wp	-		
	100+Wp	-		

South Asia Insights

Countries Overview

With 435,000 units sold, India remains by far the largest market in South Asia. As fewer companies focus on solar energy kits in Bangladesh, we are less and less often able to share data on that market. In the first half of 2022, large humanitarian purchases in Pakistan and Afghanistan account for a large part of the sales outside India.

Off-grid solar appliances

Product Trends

608,000 units were sold between January and June 2022, more than 99% of which were fans. This is a 421% increase compared to the second half of 2021. Fans play a key role in helping households cope with high temperatures and increasingly frequent and strong heatwaves. In 2022, both India and Pakistan recorded temperatures up to 50°c.[42] There is an active local industry, notably in Pakistan, serving off-grid and weak-grid customers with DC and, more and more commonly, AC/DC fans.[43] However, reporting by GOGLA affiliates has been intermittent in the past and now shows signs of becoming more regular. The peak in sales for this round can be linked to a combination of factors.

These include

- New companies with significant sales volumes joined the data collection.
- Fan sales are higher during the first half of the year than during the second half of the year. Companies have indicated that fan sales operate on a pre-booking system, causing distributors to purchase fans in bulk quantity early in the year and then selling stock to end-users from March onwards, reordering in the next year when inventories run low.
- Feedback from industry experts also suggests that there has been an increased demand for DC fans by households in Pakistan to lower their energy consumption and expenses.

In contrast with trends in Sub-Saharan Africa, fans in South Asia are generally sold separately from a power source and are almost exclusively cash sales. The prevalence of cash in the region can be seen as a result of the limited penetration of PAYGo sales in the region more broadly, and is also applicable to solar energy kits. However, this does not mean that customers do not have access to financing as microfinance institutions are key players in the distribution and financing of off-grid solar and energy-efficient appliances in the region. Furthermore, the product mix in the off-grid energy access market more broadly leans towards component-based systems than towards the kits being favored in Sub-Saharan Africa, which limits product bundling.

260 TV sales were also recorded in South Asia. Due to limited data, no trend analysis is available for TVs and no other data points can be shared for other appliances.

Figure 33 - Semi-annual Evolution of Sales Volumes of Key Appliances – South Asia

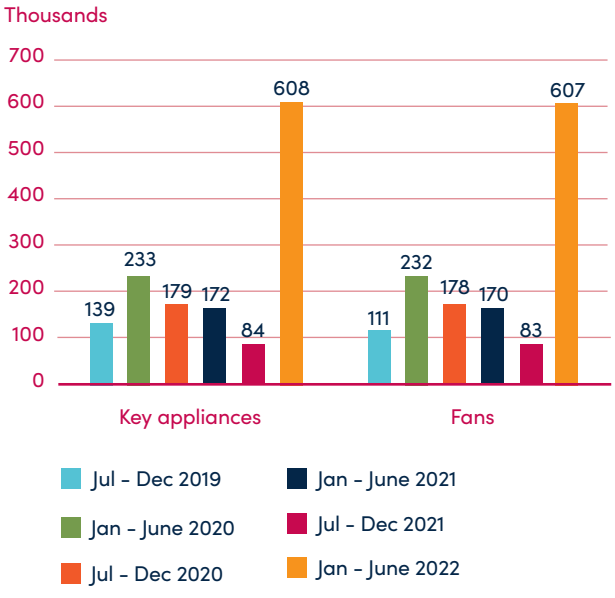


Table 13 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits by Country - South Asia

Region / Countries	Jan-Jun 2022 volumes Solar Energy Kits (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021
South Asia	**610,876**	**27%**	**51%**
India	435,412	39%	-41%
Pakistan	61,154	635%	379%

42 World Meteorological Organization, Climate change made heatwaves in India and Pakistan "30 times more likely", 2022.
43 Efficiency for Access, Pakistan Off- and Weak-Grid Solar Appliance Market, 2022.

South Asia Insights

India Insights

Background

India's economy was severely affected by the COVID-19 pandemic until the second half of 2021. Despite uncertainties and increasingly damaging effects of climate change, India has been one of the fastest growing economies in Asia in 2022. However, inflation will place disproportionate pressure on low-income households' finances. This means market segments typically addressed by the off-grid solar industry may be constrained in their expenses.

Furthermore, sales reported in India have been on a structurally declining trend as the product mix is evolving away from traditional off-grid products like solar lanterns towards weak-grid products which this report does not aim to capture. Companies in the off-grid sector are adapting to this progressive pivot and diversifying to include weak-grid products in their portfolio. Nonetheless, lanterns and other off-grid solar solutions remain relevant for the Indian market for outdoor usage, as a back-up to the grid or as a primary source ahead of the grid.[44]

Sales Trends

Off-Grid solar energy kit

Sales of Solar energy kits decreased by 5% compared to the second half of 2021 and now stand at 435,000 units. 96% of volumes were sold in cash. The drop in sales is mostly due to lower sales of small portable solar lanterns (0-1.5Wp), while sales of lanterns with phone charging (1.5-3Wp) and multi-light systems grew. SHS sales represent less than 1% of total sales.

Appliances

Just under 7,000 units of key appliances were sold in India between January and June 2022, a 36% decrease compared to the second half of 2021. Of these, 85% are fans. All fans were sold cash, and 61% were bundled with a power system.

Too few companies reported sales of other appliances to include the data in this report. Sales of TVs, RUs and SWPs were reported.

Figure 34 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits – India

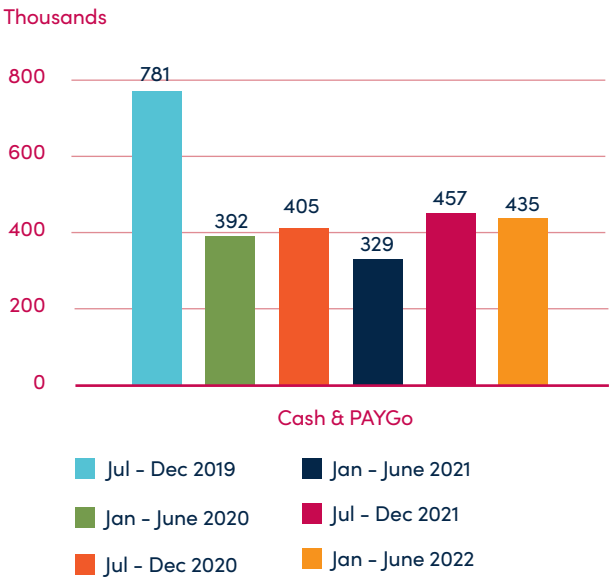
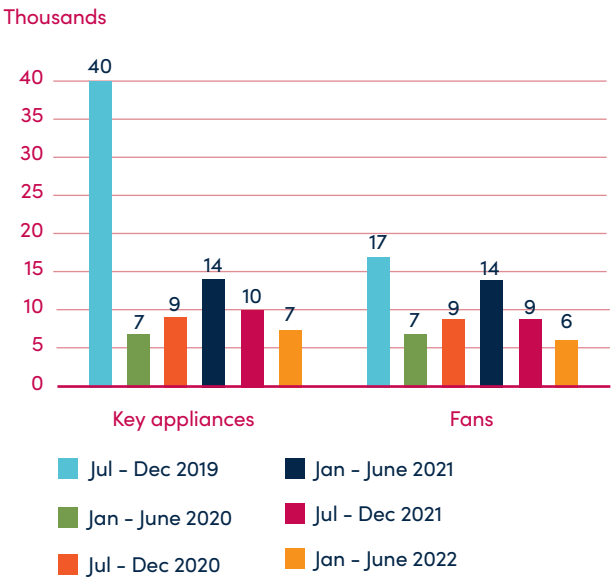


Figure 35 - Semi-annual Evolution of Sales Volumes of Key Appliances – India



44 Harrington, E., Athavankar, A. and Hsu D. (2020), Variation in rural household energy transitions for basic lighting in India, Renewable and Sustainable Energy Reviews, Volume 119. ISSN 1364-0321. https://doi.org/10.1016/j.rser.2019.109568.

East Asia & Pacific Insights

East Asia & Pacific Insights

Regional Sales Trends

Off-Grid Solar energy kits[45]

Sales of off-grid solar energy kits totaled 103,000 units in the region between January and June 2022. This is a 44% decrease in sales compared to the second half of 2021. Sales in the region follow a seasonal pattern with consistently lower sales in the first half of the year. 84% of sales during the first half of 2022 were cash sales. PAYGo sales decreased by 60% following particularly high sales during the second half of 2021. Further data collection is needed to confirm PAYGo sales trends.

Product Trends

All product categories recorded lower sales with the exception of the 50-100Wp SHS.

Figure 36 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits – East Asia and the Pacific

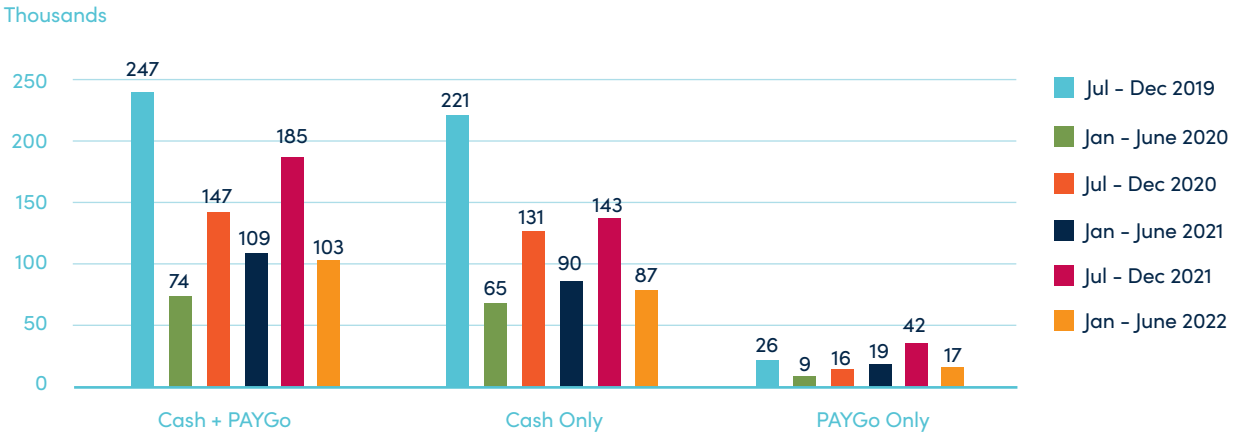


Table 14 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits by Category – East Asia and the Pacific

Categories		Jan-Jun 2022 volumes Solar Energy Kits (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021	Share of PAYGo
Lanterns	0-1.5Wp	**42,899**	-14%	103%	0%
	1.5-3Wp	**22,973**	-65%	100%	0%
Multi-light systems	3-10Wp	**17,068**	-34%	37%	-
Solar Home Systems	11-20Wp	**15,810**	-60%	-39%	-
	21-49Wp	**1,288**	-48%	-74%	-
	50-100Wp	**3,175**	110%	-90%	-
	100+Wp	-			-

45 Exceptionally, the sales of solar energy kits for January-June 2022 to East Asia and the Pacific presented in this report exclude units sold to China. This is usually not necessary. However this round several companies were unable to report sales to the country of destination where they will be sold by distributors and instead reported those sales to China. These sales are counted as part of Global sales.

East Asia & Pacific Insights

Countries Overview

Reported sales of solar energy kits in most countries in the region have historically been irregular and identifying patterns is difficult. For example, sales in the Philippines spiked during the second half of 2021 due to what can anecdotally be attributed to bulk purchases.

Off-grid solar appliances

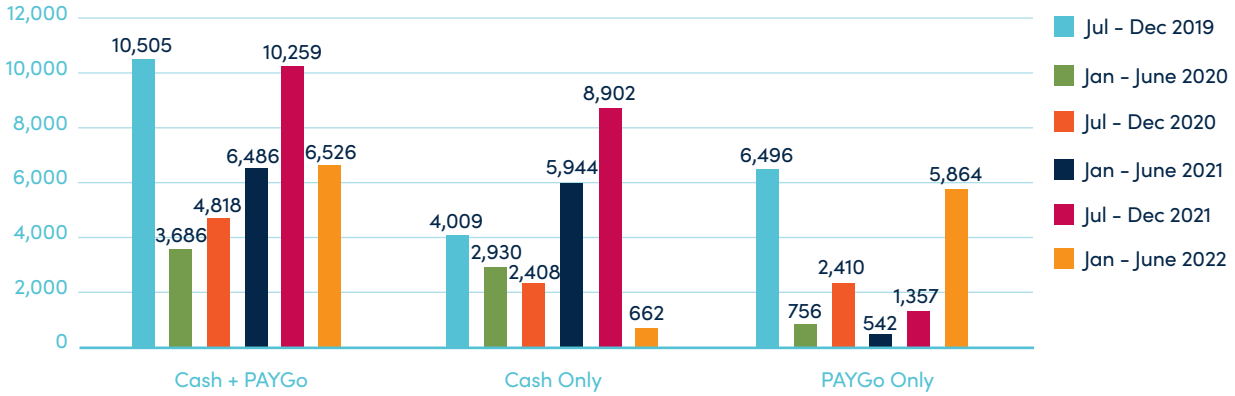
6,500 units were sold between January and June 2022, a 36% decrease compared to the second half of 2021, but on par with the first half of 2021. As the appliance sector was still nascent pre-COVID-19 in PNG, and sales have yet to have followed a clear pattern, additional data collection will be required to identify whether this decrease is the sign of a downward trend or a sign of seasonality.

Table 15 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits by Country – East Asia and the Pacific

Region / Countries	Jan-Jun 2022 volumes Solar Energy Kits (Cash & PAYGo)	% change v. Jul-Dec 2021	% change v. Jan-Jun 2021
East Asia & Pacific	**103,378**	**-44%**	**-5%**
Papua New Guinea	54,335	-22%	29%
Philippines	20,622	-36%	-62%
Indonesia	6,493	-34%	

NOTE:
Countries not featured in this table did not see enough companies reporting to pass the three-data point rule.

Figure 37 - Semi-annual Evolution of Sales Volumes of Key Appliances – East Asia and the Pacific



East Asia & Pacific Insights

Papua New Guinea (PNG) Insights

Background

The access to energy sector benefited in the past from support of the 'Pawarim Komuniti' grant program set up by the Australian Department of Foreign Affairs and Trade (DFAT). The first four projects began implementation in early 2021. Future funding rounds of the project will focus on mini-grids.

Further support is coming from the USAID-led PNG Electrification Partnership (PEP) which was announced in November 2020. As part of this program, close to $800,000 are dedicated to grants for off-grid solar.

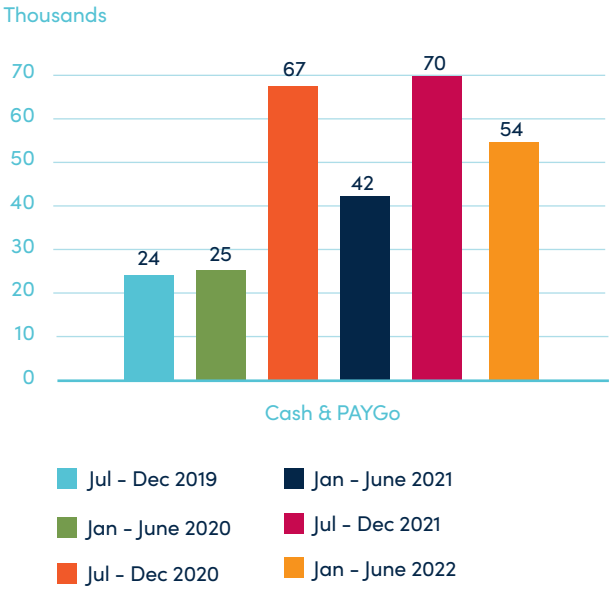
Sales Trends

Off-Grid solar energy kit

Off-grid solar energy kit sales totaled 54,000 units in the first half of 2022. This represents a 22% decrease in volumes compared to the second half of 2021. However, this is likely a seasonal decrease in sales which the next round of data collection will confirm. The vast majority of products were sold cash.

No companies reported appliance sales in Papua New Guinea during the first half of 2022.

Figure 38 - Semi-annual Evolution of Sales Volumes of Solar Energy Kits – Papua New Guinea



Global Impact

Global Impact

Estimated Impact of Off-Grid Solar energy kits and Appliances Sold by Affiliates

101 million
people currently living in a household with improved energy access[46]

2.6 million
people currently using their SHS to support an enterprise

55 million
people currently accessing Tier 1 energy services, based on the Sustainable Energy for All Global Tracking Framework

14 million
people currently accessing Tier 2 energy services based on the Sustainable Energy for All Global Tracking Framework

$13.5 billion
savings on energy expenditure, over the expected lifetimes of all portable lanterns or multi-light systems sold since July 2010

94 million
metric tons of CO_2e emissions avoided, over the expected lifetime of all off-grid solar energy kits sold since July 2010

29,000
metric tons of CO_2e emissions avoided, over the expected lifetime of all TVs and fans sold since July 2018

$7 billion
additional income generated as a result of off-grid lighting system ownership, over the expected lifetime of all off-grid solar energy kits sold since July 2010

4.9 million
people currently undertaking more economic activity as a result of using off-grid solar energy kits

6.3 million
people currently benefiting from high performing, off-grid televisions

6.6 million
people currently accessing cooling service from high performing, off-grid fans

272,000
people currently benefiting from solar water pumps

103,000
people currently accessing cooling service from high performing, off-grid refrigeration units

46 In this context, 'improved' is used to reflect lighting and energy provided by appropriate (less expensive, less dangerous, better quality) technologies such as solar, instead of baseline technologies such as kerosene lanterns, battery lights, candles, or even poor-quality solar products etc.

Global Impact

Energy Access

GOGLA affiliates have cumulatively provided access to energy to over 400 million people based on sales reported to GOGLA alone. From these affiliate sales, 101 million people are currently benefiting from improved energy access through an off-grid solar product. Of these 101 million, 55 million are currently accessing Tier 1 systems and 14 million are accessing larger SHS, Tier 2, solutions.[47]

The prolonged fall in sales volumes caused by the COVID-19 pandemic, along with past sales reaching their expected lifespan, had led to a stagnation in the number of people currently benefiting from energy access. The return to growth is slowly translating into increased energy access again. However, to reach SDG7, the off-grid sector must play its part in not only reaching first time users, but also providing replacement products for existing off-grid solar customers.[48]

Economic Impacts of solar energy kits

4.9 million people are currently undertaking more economic activity as a direct result of owning an off-grid solar energy kit. Cumulatively, economic opportunities unlocked or improved through ownership of off-grid solar products has led to $7 billion in additional income generated by customers since 2010. Coupled with the savings that smaller off-grid products, such as lanterns and multi-light kits, have created for households, the benefit to the finances of millions of low-income households is over $20 billion since 2010.

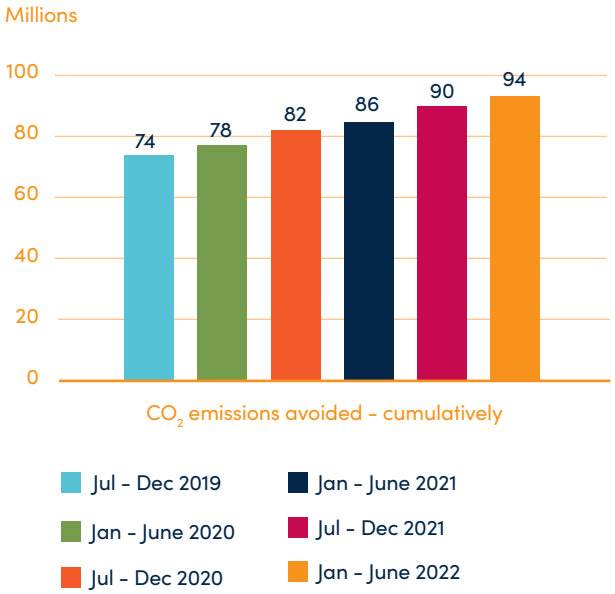
In particular, off-grid solutions are boosting economic opportunity across rural and peri-urban communities. An estimated 2.6 million small and micro-enterprises are currently supporting their activity with off-grid solar products. The majority of these are based in rural regions.

Environment & Air Pollution

Total CO_2e emissions avoided through kerosene replacement for lighting since 2010 (across product lifetime) now exceeds 94 million metric tons. This is equal to the emissions avoided by taking 20 million gasoline-powered cars off the streets for a full year.[49] Emissions reductions also have critical health benefits. Emissions are avoided when off-grid solar solutions replace the use of toxic kerosene lamps. Research shows that inhalation of kerosene can lead to respiratory illness, pneumonia and tuberculosis[50, 51] and that its most damaging effects are on women and children. Removing kerosene pollution from homes significantly improves air quality and health.

Emissions are also avoided when solar appliances replace appliances powered by diesel generators. Emissions avoided by high-performing fans and TVs since July 2018 are already close to 29,000 metric tons. This is equivalent to the greenhouse gas emissions avoided by running 8 wind turbines for a year.

Figure 39 - Semi-Annual Evolution of CO2e Emissions Avoided Through Usage of Solar Energy Kits Cumulatively - World



47 The Tiers of Energy Access are computed based on the Sustainable Energy for All (SEforAll) Global Tracking Framework. Tier 1 refers to basic energy access, including lighting and phone charging, while households with Tier 2 access receive enough electricity to additionally power energy-efficient household appliances such as TVs.

48 Lighting Global, IFC, Efficiency for Access, GOGLA and Open Capital Advisors, Off-Grid Solar Market Trends Report 2022: Outlook 2030, 2022.

49 United States Environmental Protection Agency (2021), Greenhouse Gas Equivalencies Calculator.

50 Pokhrel et al. (2010), Tuberculosis and Indoor Biomass and Kerosene Use in Nepal: A Case–Control Study.

51 Bates et al. (2013), Acute Lower Respiratory Infection in Childhood and Household Fuel Use in Bhaktapur, Nepal.

Global Impact

Access to High-Performing TVs

An estimated 6.3 million people are benefiting from the use of off-grid TVs and are being used in 123,000 businesses.

TVs and other communication devices, such as radios and mobile phones, provided vital access to access health information, educational programs and news during the pandemic, and they continue to both bring communities together, and connect them with important knowledge. An estimated 5.6 million people currently have access to information through news, current affairs and political programs they can access on their high-performing TVs sold by affiliates.

Access to High-Performing Fans

High-performing fans are currently benefiting over 6.6 million people and are being used within 38,000 businesses.

Predominantly sold in South Asia, off-grid fans are a critical tool to combat heat stress. With climate change leading to longer and more pronounced periods of intense heat, the importance of cooling systems to keep body temperature at a safe level cannot be understated - and high efficiency, off-grid technologies have a significant role to play. An estimated 6.2 million people currently experience improved thermal comfort from a high-performing fan sold by affiliates.

Access to Solar Water Pumps and Refrigeration Units

272,000 people are currently benefiting from access to a solar water pump sold by affiliates through agricultural outcomes or improved access to water.

103,000 people are currently benefiting from high-performing RUs sold by affiliates, ensuring reduced food wastage and improved food safety. Research has also shown that RUs sold by affiliates are likely used for income generating activities by a majority of customers.[52]

© Harness Energy

52 Efficiency for Access and 60_decibels, Uses and Impacts of Off-Grid Refrigerators, 2022.

Global Impact

Table 16 - Global Impact by Product Category - Solar Energy Kits

Product Categories	People with improved energy access - cumulatively	People with improved energy access - currently	People with access to Tier 1 energy services - currently	People with access to Tier 2 energy services - currently
All categories	**401 million**	**101.3 million**	**55.3 million**	**14.4 million**
0-1.5 Wp	162.9 million	25.9 million	5.5 million	0
1.5-3Wp	151.8 million	31.7 million	24.8 million	0
3-10Wp	52.3 million	20 million	17.5 million	0
11-20 Wp	11.7 million	7.3 million	6.6 million	0.008 million
21-49 Wp	8.6 million	5.7 million	0.8 million	4.4 million
50-100 Wp	9.4 million	7.7 million	0.02 million	7 million
100+ Wp	3.8 million	3.1 million	-	3 million

Product Categories	People undertaking more economic activity	People using products to support enterprise	People that spend more time working	Additional income generated - cumulatively
All categories	**4.9 million**	**2.6 million**	**2.4 million**	**US$ 7.4 billion**
0-1.5 Wp	0.7 million	0.5 million	0.3 million	US$ 1.7 billion
1.5-3Wp	0.9 million	0.6 million	0.3 million	US$ 1.5 billion
3-10Wp	1.7 million	0.8 million	0.9 million	US$ 2.3 billion
11-20 Wp	0.5 million	0.2 million	0.3 million	US$ 0.5 billion
21-49 Wp	0.4 million	0.1 million	0.2 million	US$ 0.5 billion
50-100 Wp	0.5 million	0.2 million	0.3 million	US$ 0.5 billion
100+ Wp	0.2 million	0.09 million	0.1 million	US$ 0.3 billion

Product Categories	Additional light hours used - cumulatively	Additional light hours used - household (average)	Change in quality of light - household (average)
All categories	**107.8 billion**	**2,134**	**216**
0-1.5 Wp	42.1 billion	2,238	-10
1.5-3Wp	40.2 billion	2,324	54
3-10Wp	12.8 billion	1,656	155
11-20 Wp	3.3 billion	1,610	298
21-49 Wp	2.6 billion	1,692	763
50-100 Wp	4.7 billion	2,787	516
100+ Wp	2 billion	2,875	2,024

Table continues on next page >

Global Impact

Product Categories	Change in energy spending - cumulatively	Change in energy spending - household	Kerosene lanterns replaced - currently	CO2e emissions avoided - cumulatively
All categories	**US$ 13.5 billion**	**$191**	**18.9 million**	**94.1 million**
0-1.5 Wp	US$ 6.8 billion	$195	5.2 million	37.7 million
1.5-3Wp	US$ 5.1 billion	$172	6.3 million	34.3 million
3-10Wp	US$ 1.5 billion	$218	3.4 million	11.8 million
11-20 Wp	$-	$-	1.2 million	2.9 million
21-49 Wp	$-	$-	1.1 million	2.5 million
50-100 Wp	$-	$-	1.2 million	3.2 million
100+ Wp	$-	$-	0.5 million	1.6 million

NOTE:

- Impact is estimated using the GOGLA Standardized Impact Metrics for the Off-Grid Solar Energy Sector. Please note that the current approach is based on best available research information and data. All numbers calculated using the metrics should be interpreted as estimates.
- Lanterns 0-1.499Wp include one light and no mobile charging, lanterns 1.5-2.999Wp one light and mobile charging, and multi-light systems 3-10.999Wp at least two lights and mobile charging. Solar home systems >11Wp are classified based on panel wattage.

Global Impact

Table 17 - Global Impact by Product Category - Appliances

Appliance types	Number of people who gained first time access to an off-grid appliance - cumulative	Number of people who currently have access to an off-grid appliance	Number of customers/HH currently accessing off-grid appliances through flexible financing	Tonnes of CO2 emissions avoided
TVs	7,542,434	6,335,597	1,092,328	17,519
Fans	12,342,598	6,608,532	122,489	11,474
RUs	133,317	103,028	8,259	Unavailable
SWPs	273,297	271,563	26,606	Unavailable

Appliance types	Number of People using their appliance to support enterprise	No. of people generating additional income	Number of people accessing information through TV	Number of people who are experiencing improved thermal comfort
TVs	123,421	54,854	5,638,681	N/A
Fans	37,944	Unavailable	N/A	6,212,020
RUs	Unavailable	Unavailable	N/A	N/A
SWPs	Unavailable	Unavailable	N/A	N/A

NOTE:

- Impact is estimated using the Off- and Weak-Grid Appliances Impact Assessment Framework developed by Efficiency for Access and Rural Senses/SVT and the Standardised Impact Metrics for High-Performing Appliances: Fans and TVs developed by GOGLA and Efficiency for Access. Please note that the current approach is based on best available research information and data. All numbers calculated using the metrics should be interpreted as estimates.
- Results are marked as "N/A" when a given metric is not applicable for the appliance type considered. Results are marked and "Unavailable" where the metric is applicable but is not yet available as part of this data collection and reporting exercise.

Methodology of Sales Data Collection

Methodology of Sales Data Collection

General

Overview

Every six months, GOGLA with support from Lighting Global, the Efficiency for Access coalition (the Partners) and Berenschot collect data from participating companies through an online survey. Companies share data on product specifications and volumes sold per product and per country for the past half-year. Products include Solar energy kits (solar lanterns, multi-light systems and solar home systems) and energy-efficient electric appliances (with a focus on TVs, fans, refrigeration units and solar water pumps). This report collected sales data for the period ranging from January to June 2022.

Collected data is processed and aggregated by GOGLA and Berenschot, with support from Partners, to provide the insights needed for this report. All data goes through a thorough quality control process to ensure consistency, but companies are ultimately responsible for accurate reporting.

Data is collected from manufacturers and distributors (see definition below). To avoid double-counting sales, only data compiled from companies categorized as manufacturers is presented. Data published in this report is mostly aggregated sales volumes data. Other computations include:

- The estimated market value for Solar energy kits is calculated separately for cash and PAYGo products (see definitions below). For cash sales, market value is determined by multiplying the sales volume by an estimate of retail price. This price is based on FOB prices reported by companies and a mark-up to estimate margins. For PAYGo, sales volumes are multiplied by the Total Cost of Ownership (TCO, see definition below).
- The newly installed capacity from Solar energy kits represents the total peak power output of solar panels deployed during this reporting round.
- The sector's impact is estimated using the Standardized Impact Metrics for the Off-Grid Solar Energy Sector,[53] the Standardized Impact Metrics for High-Performing Appliances: Fans and TVs[54] and the Off- and Weak-Grid Appliances Impact Assessment Framework.[55]

The detailed methodology can be accessed on the GOGLA website.

Key definitions

Cash/PAYGo:

- **Cash sales** are when the product is sold to the customer in a single transaction. Note that this category also typically includes products purchased as a tender by governments and humanitarian agencies.
- **Pay-As-You-Go (PAYGo) sales** are when the customer pays for the product in installments over time or pays for use of the product as a service. This includes products sold by distributed energy service companies (DESCOs), as well as those sold as lease-to-own.

Manufacturers/Distributors: Companies are classified as distributors when they are selling other companies' branded products, or as manufacturers when they are selling their own-brand products.

Total Cost of Ownership: The TCO represents the average amount received from a customer repaying the product in full and on time, including deposit payment and all regular daily, weekly, or monthly payments, without applying a financial discount rate to this value.

Scope

Participating companies

This report solely includes data on products sold by affiliates. Affiliates are companies connected to the partner organizations involved in the reporting process. Companies include GOGLA members, companies selling products that meet VeraSol Quality Standards, and appliance companies that participated in the Global LEAP Awards or are engaging with the Low Energy Inclusive Appliances (LEIA) program. **96 companies participated in this round and reported sales covering the period July-December 2021**. Among them 62 reported sales for both solar energy kits and appliances, 19 just for Solar energy kits and 15 just for appliances.

53 GOGLA, Standardised Impact Metrics for the Off-Grid Solar Energy Sector.
54 CLASP, Standardised Impact Metrics for High-Performing Appliances: Fans and TVs.
55 Efficiency for Access, Off- and Weak-Grid Appliances Impact Assessment Framework.

Methodology of Sales Data Collection

Table 18 - List of Participating Companies

#	Company Name	Off-Grid Solar Lighting	Off-Grid Solar Appliances
1	A4&T Power Solutions Limited	DIS	DIS
2	Afreesun Limited	MAN	-
3	Agsol	-	MAN
4	Alternative Energy Technologies Group (Altech Group)	DIS	DIS
5	ARESS	DIS	DIS
6	BAOBAB+	DIS	DIS
7	Barefoot Power	MAN	MAN
8	Bboxx Ltd.	MAN	MAN&DIS
9	BEEBEEJUMP TECHNOLOGY CO LTD	MAN	-
10	BioLite	MAN	MAN
11	Bonergie SARL	DIS	DIS
12	Bright Products AS	MAN	-
13	Celfre Energy (Private) Limited	-	DIS
14	d.light design. Inc.	MAN	MAN
15	DAVIS & SHIRTLIFF LTD	MAN	MAN
16	Devidayal Solar Solutions Pvt. Ltd.	-	MAN
17	Earth Technologies	MAN	MAN
18	Easy Solar (Azimuth)	DIS	DIS
19	Energy + SA	DIS	DIS
20	ENGIE Energy Access	MAN	MAN
21	Ennos AG	-	MAN
22	FINCA PUS LLC T/A BrightLife	DIS	DIS
23	Fosera Solarsystems GmbH & Co. KGaA	MAN	MAN
24	FUTUREPUMP LIMITED	-	MAN
25	GLOBAL ICE TEC AG	-	MAN
26	Goodbook Investments/Kumusha Power	DIS	-
27	GREENLIGHT PLANET INCORPORATED	MAN	MAN&DIS
28	INNOVATION AFRICA LIMITED	-	DIS
29	JUA Energy Company Limited	MAN	MAN
30	KATEK Memmingen GmbH	-	MAN
31	Khursheed Fans	-	MAN
32	Koolboks	-	MAN
33	Lagazel	MAN	-
34	LittleSun GmbH.	MAN	-
35	Mango Energy Technologies co. Ltd	MAN	-
36	M-KOPA	MAN	MAN&DIS
37	Namene Solar Lights Limited	MAN	-
38	NIWA	MAN	MAN
39	Offgridsun	MAN	MAN
40	OmniVoltaic Energy Solutions Company Limited	MAN	MAN
41	Oolu Solar	DIS	DIS
42	Oorja Development Solutions India Private Limited	-	DIS
43	Pawame	DIS	DIS
44	PEG Africa	DIS	DIS
45	Plug The Sun Limited	MAN	MAN&DIS
46	Qingdao LEFF International Trading Co.. Ltd	MAN	MAN
47	Qotto	MAN&DIS	MAN&DIS
48	RDG Collective	MAN&DIS	MAN&DIS
49	SelfChill	-	MAN
50	SHENZHEN JCN NEW ENERGY TECHNOLOGY CO.,LTD	MAN	-
51	SHENZHEN POWEROAK NEWENER CO.,LTD	MAN	MAN
52	Shenzhen Power-solution Ind.. Ltd.	MAN	MAN
53	Shenzhen Solar Run Energy Co..Limited	MAN	MAN
54	Simusolar. Inc.	-	MAN
55	Sinoware Technology Co.. Ltd	MAN	-
56	Smarter Grid International	MAN	MAN
57	Solar Panda	MAN	MAN
58	Solar Sister	DIS	DIS
59	Solar Village AS	MAN	MAN&DIS
60	SolarHome	DIS	DIS
61	SOLARNOW	DIS	DIS
62	SolarWorks! BV	DIS	DIS
63	Solibrium Solar Ltd. (Kenya)	DIS	DIS
64	Sosai Renewable Energies Company	DIS	DIS
65	Starco Fans	-	MAN
66	StarTimes Solar	MAN	MAN
67	SunCulture	MAN	MAN
68	SunDanzer	-	MAN
69	SUNKEN LIMITED	-	DIS
70	Sunny Irrigation Ltd	-	DIS
71	SunnyMoney (SolarAid)	DIS	DIS
72	Super Star Renewable Energy Limited	MAN	MAN&DIS
73	Tamoor fans	-	MAN
74	The Sure Chill Company	-	MAN
75	TotalEnergies Offgrid Solar Solutions SAS	MAN&DIS	MAN&DIS
76	upOwa	DIS	DIS
77	Villageboom	MAN	-
78	VITALITE Senegal	DIS	DIS
79	X-Solar Systems Ltd.	MAN	MAN&DIS
80	Zimpertec Gmbh & Co KG	MAN	MAN&DIS
81	Zola Electric	MAN	MAN
82	Zonful Enterprises (Pvt) Ltd T/A Zonful Energy	DIS	MAN&DIS
83	Zuwa Enegry (Pty) Limited	DIS	DIS

NOTE:

Companies are classified as either distributors (DIS) of other companies' branded products, or as manufacturers (MAN) if they are selling their own-brand products. For the Off-Grid Solar Appliances category, there may be companies classified as both manufacturers and distributors, as companies often sell both their own branded appliances, while also distributing other companies' products.

All data in this report is self-reported by the companies. Although it is cross-checked for consistency, the companies are ultimately responsible for accurate reporting of product specifications, pricing information, sales volumes, and locations of sales.

Methodology of Sales Data Collection

Market Share Represented

For Off-Grid Solar Appliances, the proportion of the total market that is represented by our affiliates has not yet been accurately estimated. Most recent efforts to assess the market share of affiliates for productive use appliances (RUs and SWPs) provides a range of 20% to 50%.[56]

For Off-Grid solar energy kits, based on the recently completed analysis for the '2020 Global Off-Grid Solar Market Trends Report', it is **estimated that in 2018 sales of affiliates represent over 50% of the market for plug-and-play solar home systems. When including portable lanterns and multi-light systems the percentage of affiliates in 2018 decreases to 28%.**

Countries and Regions

The regional groupings in this report follow those outlined by the World Bank country and lending groups.[57] Sub-regional groupings in Sub-Saharan Africa follow the United Nations' categorization of geographical sub-regions.[58]

Confidentiality and the Three-data Point Rule

Data on a specific region, country or product category is only included when at least three separate product manufacturers have reported sales for any single data point **(three-data point control)**. Where there are fewer than three responses for a region, country or product category, no results are shown to protect the proprietary interests of the companies who have supplied data in support of this industry report. This is signaled by an empty bar next to the name of the region, country, or product category. To differentiate, if there are no companies reporting data, the graph shows a '0'.

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56 Lighting Global, ESMAP, Efficiency for Access, GOGLA and Open Capital Advisors, Off-Grid Solar Market Trends Report 2022: State of the Sector Report, 2022.
57 World Bank, World Bank Country and Lending Groups.
58 United Nations Statistics Division, Standard Country or Area Codes for Statistical Use (M49).

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