



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



July - December 2020, Public Report



Executive Summary

The off-grid industry is showing early signs of a slow but uneven recovery from the economic shock triggered by the COVID-19 pandemic. However, targeted support remains critical for safeguarding the industry and its vital contribution to energy access and other development goals.

Data from July - December 2020 reveals that off-grid solar lighting sales grew by 19% compared to the first half of the year, totaling 3.6 million products sold. Yet sales are still at the lowest level since 2015. The sector's growth is far from the rate needed to achieve universal electrification targets by 2030. Appliance sales, meanwhile, plateaued at 470,000, with numbers failing to reach the levels of growth anticipated before the global health and economic crisis. Looking at 2020 as a whole, the drop in market growth due to the impacts of COVID-19 resulted in an estimated 10- 15 million people and 300,000 - 450,000 enterprises missing out on improved energy access.¹

The easing of lockdown restrictions in many countries in the second half of 2020 contributed to increased sales volumes compared to the first half of the year. Strong consumer demand in many markets, despite the additional cash constraints placed on off-grid households as a result of the pandemic, also demonstrated the importance that energy poor homes and businesses continued to place on off-grid solutions.

However, while this led to stability in some markets, this was not universal. The impact of the pandemic - as well as other local and regional factors - led to a wide variation in sales levels. Aside from the COVID crisis, challenging conditions such as extreme weather, political events, and fiscal changes on one hand, and positive initiatives such as relief funding and new programs on the other, added to the complex picture behind the global headlines.

Looking at sub-Saharan Africa (SSA), sales of lighting products in the second half of 2020 were only 4% below the levels seen in the second half of 2019, but regionally and nationally there was significant diversity. In the largest, East African, market, sales volumes were still 10% below those seen in the second half of 2019, while sales in

West Africa and Central Africa showed a 19% and 40% increase, respectively. At the national level, examples of countries benefiting from growth in lighting sales compared to the same period in 2019 were Somalia and Nigeria, where the industry benefited from strong government support. Declines compared to the second half of 2019 were seen in countries including Uganda, Zambia and Ethiopia, linked respectively to extreme weather, retroactive import payments and a shortage of FOREX to import products. Appliance sales in SSA also saw a decline compared to the second half of 2019, however, this was noted across all regions. East Africa saw the smallest dip (5%) whilst bigger drops were seen in West Africa (11%) and Central Africa (32%). However, looking at specific technologies, positive signs also emerged, such as the increase in the sale of solar water pumps in West Africa.

In contrast to the more positive overall picture in SSA, sales of off-grid lighting in South Asia remained 43% lower than those seen in the second half of 2019. This is in large part due to the continuation of low sales rates in India. Key drivers for these were the extension of localized lockdowns until the end of August, and difficulties faced by microfinance institutions (MFIs) - the main sales channel for off-grid products in the country.² Across the region, the industry saw a growth in the sale of fans but a decrease in the sale of televisions and solar water pumps when compared to the second half of 2019.

Only a third of solar lighting companies reported stable or increased sales compared to the second half of 2019, with more than half reporting sales decreases of over 25% and a third reporting sales reductions of more than 50%.³ These reduced sales volumes and the wider impacts of the pandemic continued to add pressure on off-grid companies, with some previously buoyant enterprises reporting zero, or low, sales in the second half of 2020.⁴

1 High level estimate based on access rates if sales numbers had been similar to numbers seen in 2019 (lower bound) or had risen by the same 13% increase as they did between 2018 and 2019 (upper bound), using the Standardised Impact Metrics.

2 MFIs in India MFIs in India were not eligible for the 3-month loan moratorium that the Central Bank provided for bank borrowers. This aggravated the economic situation for MFI borrowers, already suffering from losses of jobs and income, and meant that MFI lenders needed to focus on their current loans rather than the provision of any new loans for off-grid solar purchases.

3 Ibid.

4 Bespoke analysis of the sales volumes of off-grid solar manufacturers and distributors reporting in H2, 2019, H1, 2020 and H2, 2020.

Executive Summary

The differences in company and market stability not only reveal the large variation in impacts that the COVID-19 pandemic has had on the industry, they also help to shine a spotlight on the actions or activities that have driven greater resiliency in some countries or for some organizations.

More robust sales levels can be seen where the sector has received dedicated support to respond to the crisis: where investors have implemented relief funding or worked with companies to help them to secure and enhance their operations, where government incentives have helped local markets to expand, or where programmatic innovation has helped the industry to adapt to the changing market environment. The ability of companies themselves to ‘weather the storm’ of the economic and health crisis, and adapt to the challenging operating conditions, has also played a key role.

To reinforce the sectors’ foundations and propel growth, government, development partners, and investors must incorporate lessons learnt and strengthen their support. Governments must provide the right environment for businesses to thrive and for their citizens to access clean, safe energy and appliances, development partners must adapt and enhance their programmatic and financial support, and the investment community must continue to work with companies to develop innovative financing mechanisms. **Crucially, given the extent of the economic impact of the pandemic on the sector and its customers, there is a role for an immediate increase in the availability of grant and concessional financing.**

The off-grid sector can help power recovery from the COVID-19 pandemic, drive climate resiliency and enable a billion people to switch to clean energy technologies. It supports enterprise, boosts household income, and enhances the welfare of some of the world’s poorest communities. If the market is protected and enhanced, the impact and environmental wins will be myriad. They will also be fast. We know what unlocks growth. The time to act is now.

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About the Report

Authors

GOGLA

GOGLA is the global association for the off-grid solar energy industry. Established in 2012, GOGLA now represents over 200 members as an independent, not-for-profit industry association. Its mission is to help its members build sustainable markets, delivering quality, affordable products, and services to as many households, businesses and communities as possible across the developing world. The products and solutions that GOGLA members sell transform lives. They improve health and education, create jobs and income opportunities, and help consumers save money.

To find out more, go to www.gogla.org

Lighting Global

Lighting Global is the World Bank Group's initiative to rapidly increase access to off-grid solar energy for the 789 million people worldwide living without electricity. Lighting Global - managed by the International Finance Corporation (IFC) and the World Bank - works with manufacturers, distributors, governments, and other development partners to build and grow the modern off-grid solar energy market. Lighting Global programs are funded with support from the Energy Sector Management Assistant Program (ESMAP), The Public - Private Infrastructure Advisory Facility (PPIAF), The Netherlands' Ministry of Foreign Affairs, The Italian Ministry for the Environment, Land, and Sea (IMELS), and the IKEA Foundation.

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 15 Donor Roundtable Members, 10 Programme Partners, and more than 30 Investor Network members. Current Efficiency for Access Coalition members have programmes and initiatives spanning 44 countries and 22 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

Whilst the impacts of the COVID-19 pandemic eased in some countries in the second half of 2020, the off-grid sector continued to feel their effects. Lockdowns were lifted in some geographies and companies adapted to new safety, logistical and supply chains changes. However, the economic impact of the pandemic deepened in many regions, operational issues persisted in some key territories, and new challenges emerged.

Critically, many target customers for off-grid products and services continued to be severely affected by the economic impacts of the pandemic. The World Bank estimates that more than 88 million people around the world fell back into extreme poverty in 2020.⁵ While research on sub-Saharan Africa found that the region had moved into recession for the first time in over 25 years, with *'the informal sector, a major source of income and employment one of the hardest-hit by COVID-19'*.⁶ Many of those living in off-grid households work within the informal sector.⁷

Ongoing operational issues also continued to have significant impacts in some geographies. These included restrictions on movement in countries such as Myanmar and the Philippines and the ongoing difficulties faced by microfinance institutions (MFIs) in India – one of the largest off-grid solar market – where MFIs serve the greatest number of off-grid customers.

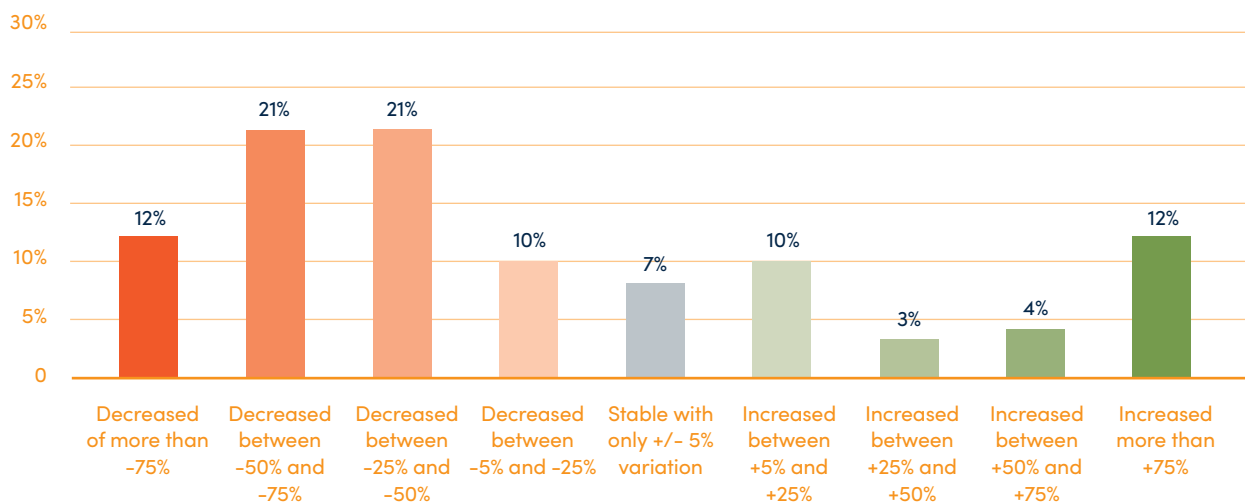
New challenges were also felt at both global and local levels.

Globally, the price of hardware and component parts increased due to raw material volatility and supply shortages, which also had a significant impact on the off-grid sector. Affiliates reported that prices for some materials rose by over 50%. Similarly, companies experienced price increases for freight and transport, and delays in processing of exports from manufacturing centers.

At the local level, deteriorating currency exchange rates and importation and custom clearance challenges were seen in some countries, while a reversal in tax and tariff exemptions for off-grid solar products was implemented in Kenya, one of the largest off-grid solar markets. The removal of the exemptions on VAT in Kenya was a direct result of the fiscal pressures that the pandemic put on the country's treasury. Further to the elimination of the VAT exemption, the East African Community also implemented a removal of the import duty exemptions that had previously helped the industry to grow across the region.

In addition, the pandemic continued to put pressure on off-grid solar companies, with some previously buoyant companies reporting zero, or low, sales in the second half of 2020. Smaller companies in particular struggled to adapt to the multiple challenges.⁸

Figure 1 - Variation on Sales Volumes in H2 2020 compared to H2 2019 for Energy Access Companies⁹



⁵ World Bank (2020), *Poverty and Shared Prosperity 2020: Reversals of Fortune*.

⁶ IFC (2021), *COVID-19 Economic Impact - Sub-Saharan Africa*.

⁷ GOGLA (2020), *Powering Opportunity. Energising Work, Enterprise and Quality of Life with Off-Grid Solar*.

⁸ EnDev (2020), *Energy Access Industry Barometer*.

⁹ Bespoke analysis of the sales volumes of off-grid solar manufacturers and distributors reporting in H2, 2019, H1, 2020 and H2, 2020.

Global Insights

Two thirds of off-grid solar lighting companies reported lower sales than in the second half of 2019, with over half reporting sales decreases of over 25% and a third reporting sales reductions of more than 50% (Figure 1). While this is a slight improvement on the situation companies faced in the first half of 2020, it remains highly concerning.

It is also a stark contrast to the momentum behind the sector at the end of 2019, when many long-standing off-grid companies were reaching an impressive level of scale, players were building critical foundations in new markets and powerful new innovations in appliance technologies and business models were emerging. All leading to a diverse range of new and influential stakeholders exploring the impact and potential of the off-grid sector.

Yet, despite the setbacks created by the pandemic, interest in off-grid solar and efficient appliances at the consumer level has not dimmed¹⁰ and, whilst equity funding into the sector has dropped by a worrying 46% compared to 2019, overall investment in 2020 remained stable (US\$ 316 million).¹¹ Many investors and development partners expanded or adapted their support for off-grid companies, with a survey of investors finding that most remain 'bullish' about the impact

of the sector and 'optimistic' about the market.¹² Reassuringly, even with the challenging conditions, in some countries where policy, programmatic or financial support helped to protect and enhance local markets, the sector was able to stabilize or – in some cases – even grow.

In 2021, ongoing impacts of the pandemic, strain on household finances, drop in equity investment, decrease in donor resources and reversal of positive regulatory support remain significant risks for the stability and growth of the sector.

However, the emergence of supportive financial initiatives, such as the REACT Kenya and Energy Access Relief Funds, program innovations like the EnDev COVID-PAY scheme, and bold policy decisions at national level, such as those seen in Senegal and Togo, can help mitigate these challenges. This support is critical to helping the sector get back to growth, unlock its potential to aid recovery from the pandemic, and drive progress towards SDG7 and other development targets.

¹⁰ 60 Decibels (2021), *Listening During COVID-19: A Year in Review*.

¹¹ Ibid.

¹² GOGLA & Catalyst Off-Grid Advisors (2020), *Off-Grid Solar Investment Trends*.

Global Insights

Sales and Impact Trends

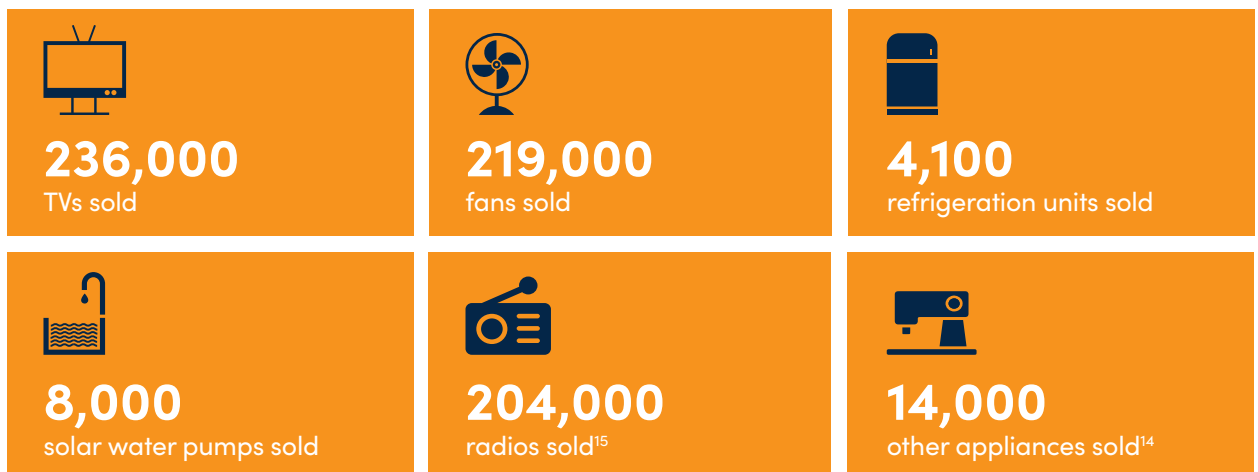
Global Key Highlights

Sales refer to all off-grid solar lighting and off-grid appliance product sales reported by participating affiliates¹³ in the period between July 1st and December 31st, 2020.

Lighting



Appliances



¹³ 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.

¹⁴ The category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery.

¹⁵ Note that radios are excluded from both 'All Appliances' and 'Other Appliances' as they are regularly sold bundled with lighting systems. Their large volumes would bias the overall results.

Global Insights

Off-Grid Solar Lighting Products

Global sales of lighting products by affiliates between July and December 2020 stand at 3.6 million units. This is a 19% increase compared to the first half of 2020, but an 18% decrease compared to the second half of 2019.

Both cash and PAYGo sales increased, after a decline in the previous reporting round. While PAYGo sales are at the same levels seen in the second half of 2019, cash sales are still well below the numbers reported in the second half of 2019.

From July to December 2020, 2.41 million units were sold on a cash basis with a value of US\$ 68.22 million – a 19% increase in volume compared to the first half of 2020, but a 25% decrease compared to the second half of 2019. 1.19 million PAYGo units were sold, with a market value of US\$ 211 million – this is 20% more than the volumes recorded in the first half of 2020, and similar to the second half of 2019.

A breakdown of the regional and country sales is offered in Table 1, and detailed insights by region and country can be found in the following chapters.



Portable Lanterns

Portable lanterns still represent the backbone of the sector, with total sales of 2.29 million. This constitutes a market share of 63%. As a percentage of the total sales, portable lanterns have been on a slowly decreasing trajectory from 70+% since 2018. In the first half of 2020, lantern sales were significantly affected by the COVID-19

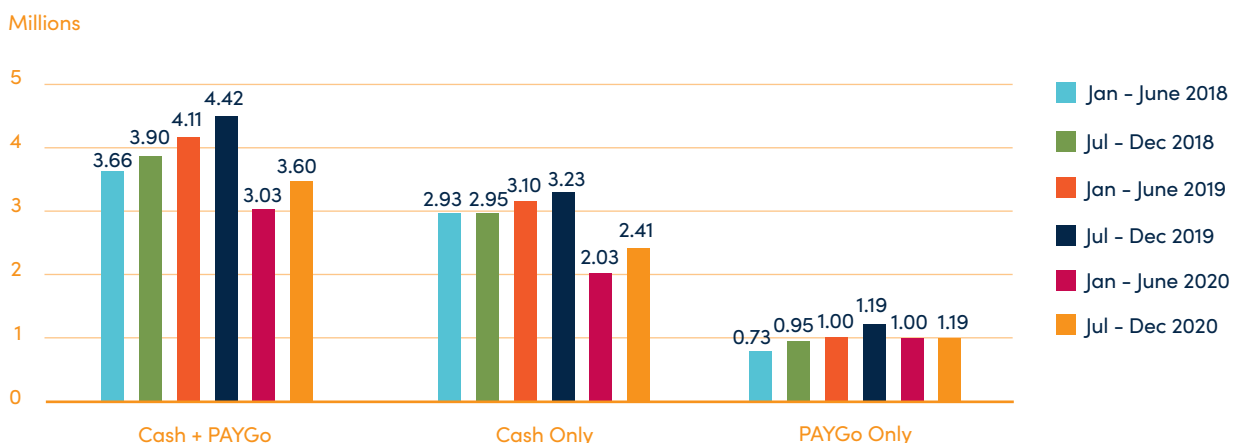
crisis, recording the largest absolute decreases amongst all product categories. In the second half of 2020, sales improved considerably in the smallest category, while lanterns with phone charging capacity recorded another minimal decrease.

Portable lanterns without mobile charging – i.e. those with an indicative wattage of 0–1.499 Wp – increased to 1.16 million. This is a 38% increase compared to the first half of 2020 and a 12% decrease compared to the second half of 2019.

Portable lanterns capable of charging mobile phones – i.e. those with an indicative wattage of 1.5–2.999 Wp – experienced a small decrease of 1% compared to the first half of 2020 and a 24% reduction compared to the second half of 2019, with 1.13 million units sold.

A growing number of portable lanterns with mobile charging were sold through PAYGo channels. The percentage of these lanterns sold via PAYGo rose to 29% in the second half of 2020 with over 326,000 units, from 22% in the first half of 2020, and 14% in the second half of 2019. This could indicate that PAYGo is increasingly enabling access to smaller product categories for customers with less purchasing power, or that customers who would normally buy solar lanterns in cash, now choose to finance these products through PAYGo due to cash constraints.

Figure 2 - Semi-annual Evolution of Volume of Lighting Products Sold - 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 instalments over time or pays for use of the product as a service.

Global Insights



Multi-light Systems

Sales of multi-light systems reached 693,000 units between July – December 2020. This represents 19% of total global sales. Sales increased 43% in this category compared to the first half of 2020. This increase compared to last round can partly be explained by new companies reporting sales in this category, as well as returning companies who did not report sales last round. Compared to the sales volumes recorded in the second half of 2019, this still constitutes a decrease of 12%.

PAYGo sales during the period account for 45% of all multi-light systems sales, which is lower compared to the levels recorded in the first half of 2020 and the second half of 2019 (both 56%).



Solar Home Systems (SHS)

SHS, larger, higher-cost products of wattage 11+ Wp, recorded sales of 620,000 units in the second half of 2020. This is a 10% increase compared to the first half of 2020, but a 25% reduction compared to the second half of 2019, when a new sales record of 830,000 units was reached. The majority of products sold in this category are capable of powering various size fans, TVs and small appliances. However, both refrigeration units and solar water pumps are typically only powered by systems with a solar module of 100+ Wp. It is this category that saw the greatest decline in sales.

The 50-100 Wp systems are the top selling SHS category by a small margin with 207,000 units. This represents a minimal 3% increase compared to the volumes of the first half of 2020 and a 6% decrease compared to the second half of 2019. Companies anecdotally suggested that the comparatively low drop in sales within this category in the second half of 2019, and the slight increase in the first half of 2020, may be a result of wealthier families purchasing products during the pandemic to provide a back-up to the grid during lockdowns. Reinforcing this anecdotal observation,

this category of SHS is well suited to providing a significant amount of power for a large or even extra-large TV or fan as well as household lighting and mobile phone charging.

The 11-20 Wp segment shows the next largest sales with over 198,000 units, seeing a 48% increase in volume compared to the first half of 2020. Sales in this category bounced back compared to the last reporting round, but it is still a 7% decrease compared to the second half of 2019.

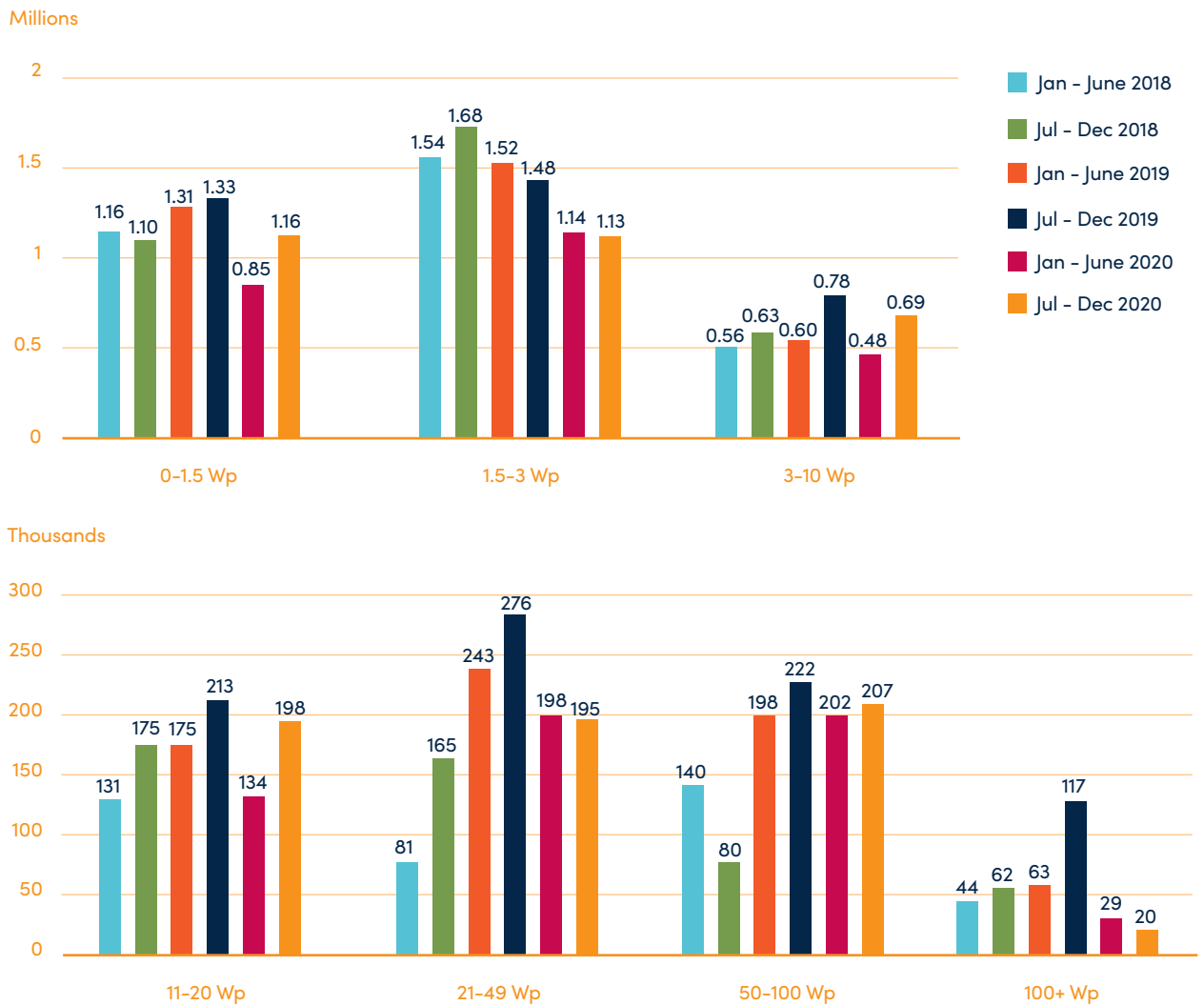
In the 21-49 Wp category, over 195,000 systems were sold between July and December 2020, a minor 1% decrease in sales compared to the previous reporting round and a 29% reduction compared to the second half of 2019.

The smallest sales recorded in the SHS space is in the 100+ Wp category with 20,000 units, the lowest number recorded since the second half of 2017. This product category experienced the largest relative reduction in the SHS segment with a 33% drop in sales compared to the first half of 2020, and an 83% decrease in comparison with the second half of 2019. This is largely driven by a drop in the South Asian market.

Approximately 89% of all SHS sold through PAYGo financing between July and December 2020, a larger share compared to the 84% in the first half of 2020 and 65% in the second half of 2019. It is generally accepted that this reflects the importance of the product financing business model for customers accessing larger, more expensive off-grid products that many would be unable to afford in a single upfront payment. Note that the PAYGo percentage has been influenced by a large number of 50+ Wp systems that were sold on a cash basis through government tenders in East Asia & Pacific in the second half of 2019.

Global Insights

Figure 3 - Semi-annual Evolution of Global Sales Volumes by Lighting Product Category - 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.

Global Insights

Table 1 - Sales of off-grid solar lighting products per region and country

Region / Country	Sales volumes		
	Total	Cash	PAYGo
sub-Saharan Africa	2.841.518	1.675.778	1.165.740
East Africa	2.200.449	1.324.244	876.205
Ethiopia	370.767	326.149	44.618
Kenya	1.033.784	439.350	594.434
Madagascar	58.511		
Malawi	93.773	74.543	19.230
Mozambique	29.069		
Rwanda	74.986	48.504	26.482
Somalia	167.385		
Tanzania	160.009	98.496	61.513
Uganda	152.064	93.190	58.874
Zambia	48.824	14.666	34.158
Zimbabwe	10.849		
West Africa	434.390	192.814	241.576
Benin	48.280	3.501	44.779
Burkina Faso	40.298	34.773	5.525
Cote d'Ivoire	26.158		
Ghana	10.579	6.201	4.378
Guinea	12.246		
Liberia	9.234		
Mali	19.050	16.216	2.834
Nigeria	200.485	103.422	97.063
Senegal	17.314	4.372	12.942
Sierra Leone	24.975		
Togo	25.471		

Region / Country	Sales volumes		
	Total	Cash	PAYGo
Central Africa	172.636	135.783	36.853
Cameroon	106.787	97.642	9.145
Democratic Republic of Congo	51.185	23.595	27.590
Southern Africa	34.043	22.937	11.106
South Africa	14.639	8.537	6.102
South Asia	479.441		
India	404.506		
Pakistan	64.989		
East Asia & Pacific	146.938	131.162	15.776
Indonesia	7.020		
Myanmar	8.541	6.955	1.586
Papua New Guinea	67.335		
Philippines	11.948	9.148	2.800
Vanuatu	8.841	7.250	1.591
Middle East & North Africa	54.494		
Latin America & Caribbean	21.450		

NOTE:

When there are fewer than three responses, no results are shown, to protect the proprietary interests of the companies who supplied data in support of this industry report. While if there are no companies reporting data at all, the graph shows a 0. Note that only an excerpt of countries is included above, excluding all the countries showing 0 sales for both cash and PAYGo.



Global Insights

Off-Grid Solar Appliances

Between July and December 2020, affiliate companies reported a total of 469,000 appliances sold globally. TVs represented 51% the majority of these sales, with 236,000 units. This was followed by fans with 219,000 units (46% of the global total). Solar water pumps (SWPs) and refrigeration units (RUs) represented a mere 2% and 1% of off-grid appliance global sales, with 8,000 and 4,100 units, respectively.

The overall total showed a 2% reduction compared to the first half of 2020, and a 2% increase compared to the second half of 2019. A 9% decrease was recorded in the cash segment compared to the first half of 2020. Meanwhile, PAYGo sales experienced a 7% increase compared to the same period.

The appliance segment was at a nascent stage prior to the start of the pandemic, and significant growth was hoped for in 2020. While this expected growth did not materialize, partly because of COVID-19 pandemic, this segment in the off-grid solar market also showed resilience. Anecdotally, companies indicated that this is because PAYGo allowed customers who were struggling financially to pay for these products over time, and because demand for information and entertainment through TVs and radios increased during lockdowns. Companies also reported that the Global LEAP Result-based financing (RBF) program, which provided financial incentives for companies selling SWPs and RUs, was a lifeline during the pandemic.

Given the diversity of markets between the main appliances which are covered in this report (from

fans, TVs to solar water pumps and refrigeration units) it is hard to generalize at this point and to draw clear conclusions on the impact of the pandemic. Future reporting rounds will offer greater insight and clarity around this.

A breakdown of the regional and country sales by appliance types is offered in Table 2, and detailed insights by appliance type, region and country can be found in the following chapters.

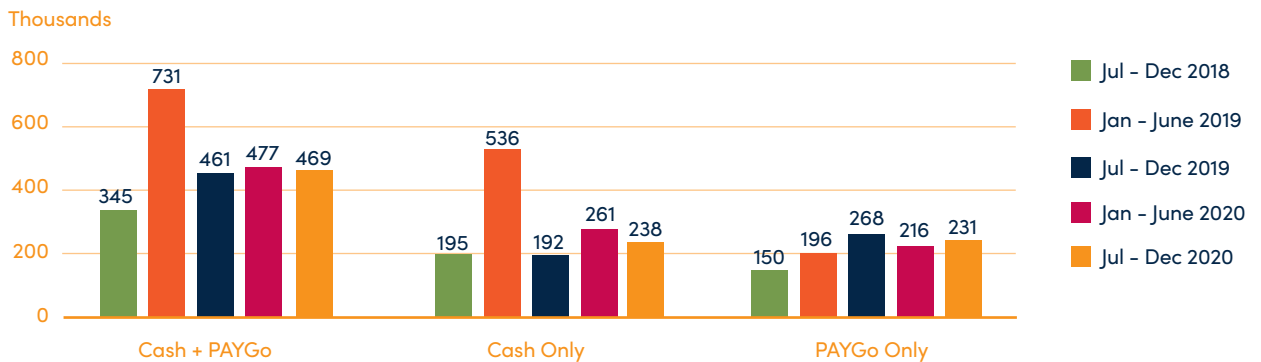


Fans

Fan sales in the second half of 2020 recorded over 220,000 units sold, a 12% decrease from the first half of 2020. However, a more appropriate comparison should be drawn with the second half of 2019, which reveals a 49% increase in global sales, as there is a strong seasonal pattern in the sale of fans. This is highlighted anecdotally by companies and evident in the sales data trends. Companies have indicated that fan sales operate on a pre-booking system, causing distributors to purchase fans in bulk early in the year and then selling this stock to end-users from March onwards, only reordering the following year when inventories run low.

While there is no clear pattern behind this dramatic growth from the same period in 2019, a recent report noted an increasing amount of fans are integrating 'BLDC or PM' (Brushless DC or Permanent Magnet) motors providing up to

Figure 4 - Semi-annual Evolution for All Appliances - World



NOTE:

- The category 'All 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 instalments over time or pays for use of the product as a service.

Global Insights

42% higher efficiency and overall system cost reduction by up to 30%.¹⁶ It is also notable that it has become increasingly common for fans to be bundled with the SHS kits in Sub-Saharan Africa that have seen strong sales during this period, a simple and effective way to accelerate update of fans leveraging established SHS markets and distribution channels.¹⁷

In terms of global sales, most fans were sold on a cash basis as visible in Figure 5. This is because the bulk of the fan sales (80%) occur in South Asia, where customers usually buy fans separate from a power system and in cash. In Sub-Saharan Africa, fans are sold bundled with an SHS in 57% of the cases, and over 20% is sold via PAYGo.

In terms of the portfolio of product categories sold, Figure 6 shows that pedestal fans with diameters around 18" are the biggest sellers this round, representing 40% of the global sales with

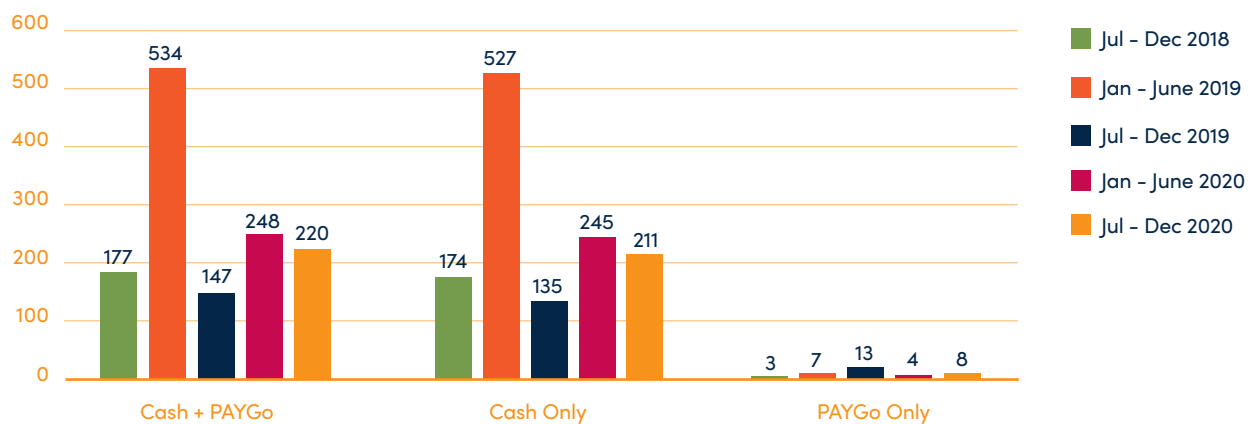
89,000 units. In the second half of 2019, and in the first half 2020, ceiling fans were the most sold category, mainly driven by sales in South Asia. Unfortunately, although the number of sales can be extrapolated as significant, it is not possible to report on the sales of this category in this round due to an insufficient number of companies reporting ceiling fan sales to satisfy our three-data point rule.

Table fans remain the smallest category with 54,000 units sold. All table fan sales reported fall in the large category, meaning that they have a diameter larger than 12". This is the only category in which a sizable percentage is sold bundled with a power system (43%).

Both pedestal and table fans have seen slightly increased sales compared to the first half of 2020, which is a break from the seasonal trends previously seen, and significantly increased sales from the comparable period of the previous year.

Figure 5 - Semi-annual Evolution for Fans - World

Thousands

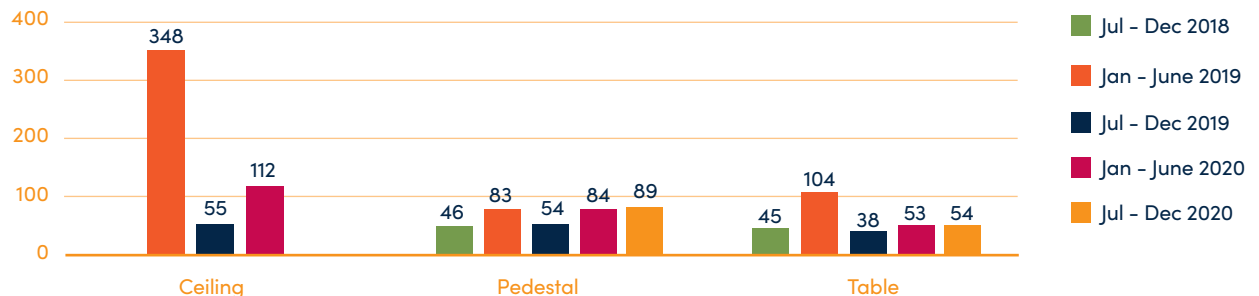


NOTE:

- 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 instalments over time or pays for use of the product as a service.
- High sales in Jan-June 2019 can be attributed to a high volume of sales triggered by significant subsidies.

Figure 6 - Semi-annual Evolution of Fans by Product Category - World

Thousands



¹⁶ Efficiency for Access Coalition (2021), The Benefits of Permanent Magnet Motors: Efficiency Opportunities in Off- and Weak Grid Appliance Markets.

¹⁷ Efficiency for Access Coalition (2021), 2021 Appliance Data Trends.

Global Insights



TVs

TVs recorded 237,000 units sold in the second half of 2020. Volumes increased by 7% compared to the first half of 2020 but decreased 16% compared to the second half of 2019. Anecdotally, companies reported that TV sales increased again as customers placed higher importance on the ability to access entertainment and information during lockdowns. This observation is not applicable to South Asia where sales of TVs decreased, and grid extension is increasingly penetrating rural areas. This trend could lead more rural consumers to access regular on-grid appliances.

90% of TVs reported have been sold via PAYGo (214,000 units), as opposed to only 23,000 units sold on a cash basis. This is because the largest market for TV sales that we are seeing is currently in sub-Saharan Africa where the PAYGo market is strong, while affiliates report limited sales in Asia where cash sales of appliances and component based SHS are more widely prevalent. **82% of the TVs reported were sold bundled with a power system, and this larger investment typically requires the consumer financing which is provided by PAYGo.** For example, research found that in Nigeria only 10% of households could afford a TV bundle without any consumer financing, while this percentage grows to 40% if financing options are available.¹⁸

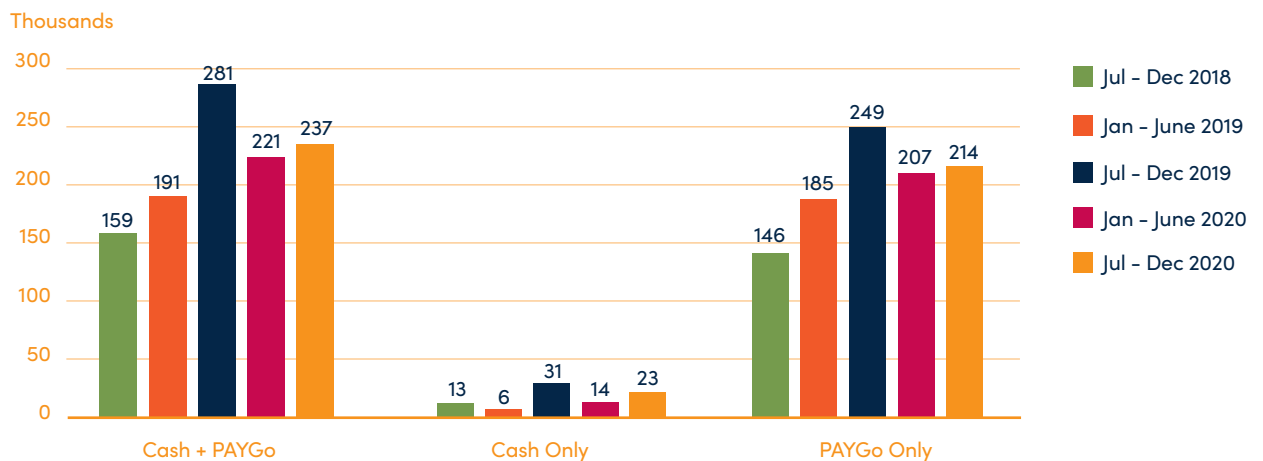
18% of all TVs have been sold as additional products to existing SHS customers, as companies typically

upsell to existing customers and enable their move up to higher tiers of energy access, building on reliable repayment behavior and often occurring when customers repay their original payment for a SHS in full.

In terms of the diversity of product categories, the majority of TVs sold fall in the large category (24–29”) with 118,000 units. This is followed by the extra-large (30+”) and the medium TVs (18–23”) with 60,000 and 55,000 units, respectively.

Sales volumes in the large TVs category remained relatively stable compared to the first half of 2020, with a decrease of only 3%, but they are not back to the levels recorded in the second half of 2019, with a decrease of 29%. The same is true for medium TVs, which increased slightly by 2% compared to the first half of 2020 but decreased by 16% compared to the second half of 2019. **Sales of extra-large TVs increased considerably, predominately in East and West Africa, with around 40% compared to both the first half of 2020 and the second half of 2019.** This can partly be explained by a reduction in price for extra-large TVs over the last few years, and companies bundling TVs with other appliances such as solar water pumps.¹⁹ **There are also anecdotal reports of an increasing amount of more wealthy customers purchasing SHS bundled with extra-large TVs during lockdown periods.** The share of extra-large TVs within the TV category subsequently increased from approximately 20% to 25%.

Figure 7 - Semi-annual Evolution for TVs - World



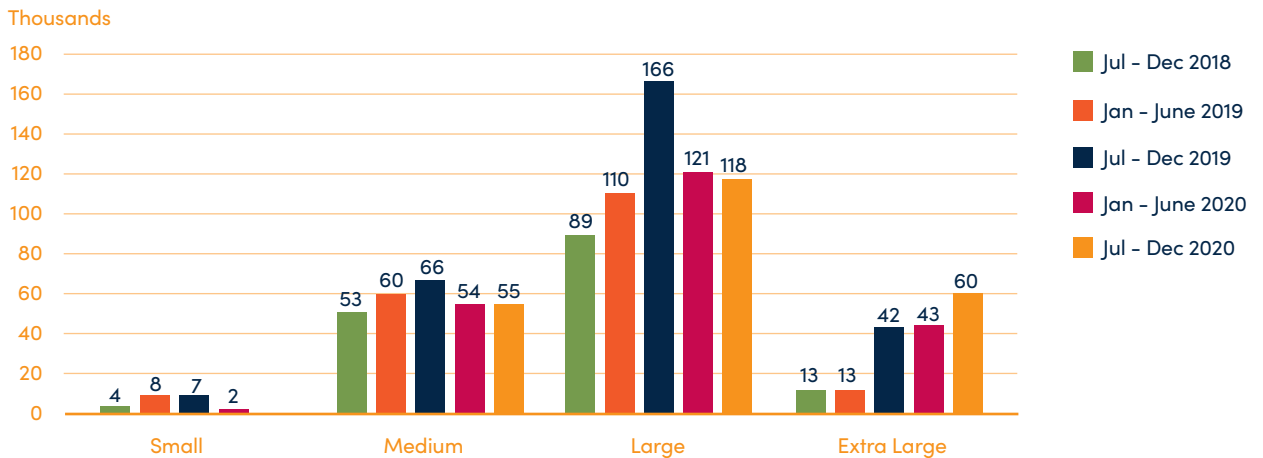
NOTE:

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 instalments over time or pays for use of the product as a service.

18 Efficiency for Access Coalition (2019), 2019 State of the Off-Grid Appliance Market Report.
 19 Efficiency for Access Coalition (2021), 2021 Appliance Data Trends.

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Figure 8 - Semi-annual Evolution of TVs by Product Category - World



For the first time we cannot include small TVs (12-17") as too few companies reported sales.

The sales of small TVs have been relatively low for several years now, registering only 2,000 units in the first half of 2020. A possible explanation is that larger TVs are becoming so efficient that the power consumption difference between large TVs and small TVs is minimal, while the perceived additional value is significant. This makes it possible for consumers to upgrade to larger TVs without a significant investment to expand solar panels and battery capacity. Companies also indicate that the off-grid solar TV market is established, and most companies are selling large and extra-large TVs as customers prefer those two sizes.



Refrigeration Units (RUs)

Off-grid and energy-efficient RUs experienced a slight decrease compared to the first half of 2020, with a 6% drop in sales, but a larger decrease of 23% compared to the second half of 2019. Between July and December 2020, 4,171 units were sold globally.

This report does not reflect the main institutional market for off-grid vaccine cold chain equipment.

Although sources indicate that - due to the COVID-19 pandemic - this period has seen an increase in the amount of high specification pharmaceutical grade vaccine cold storage equipment, some of which is off-grid, this largely follows 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 commercial mass consumer market and lower-cost specialist off-grid refrigerators designed to meet our segment's needs. While there is some crossover reflected in this report, it is marginal compared to the use of refrigeration for off-grid domestic and productive uses.

67% of refrigeration units were sold with a power system this round, where this was 51% in the first half of 2020.

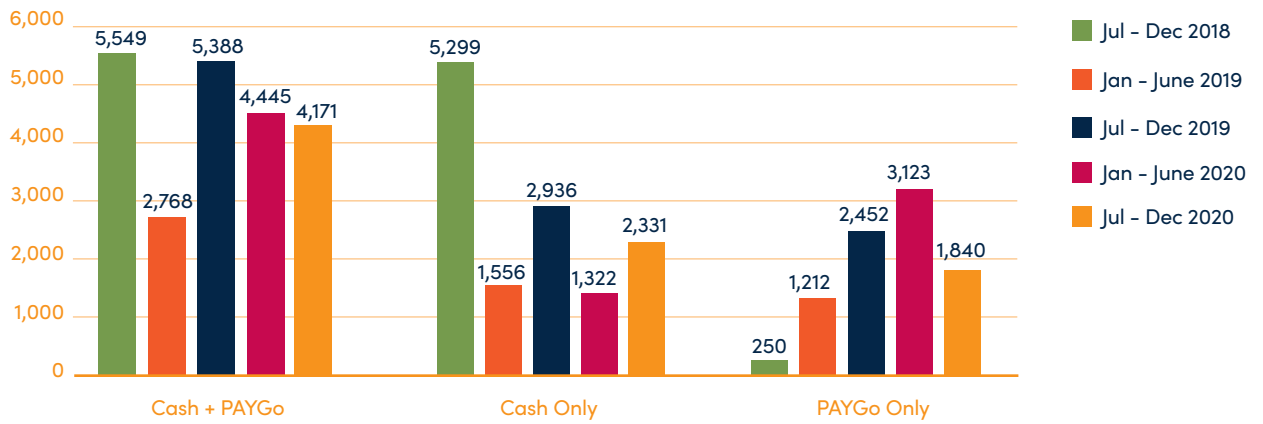
This may not reflect a market trend, and more reflective of the companies reporting data to us. As this approach is associated with the business model specific to the B2B companies reporting sales of RUs to a local distributor which then sells it to customers bundled together with a panel and a battery. These percentages will be monitored over time to observe whether RUs are increasingly sold bundled with large SHS or not.

In terms of product category diversity, refrigerators remain dominant, representing 61% of the global sales for all RUs categories with 2,535 units.

In the last reporting round, affiliates started reporting sales of freezers for the first time, but their volumes cannot yet be shown as there are less than three companies reporting. This is unfortunately also the case for the refrigerator-freezer combination units and multi-temperature refrigerators.

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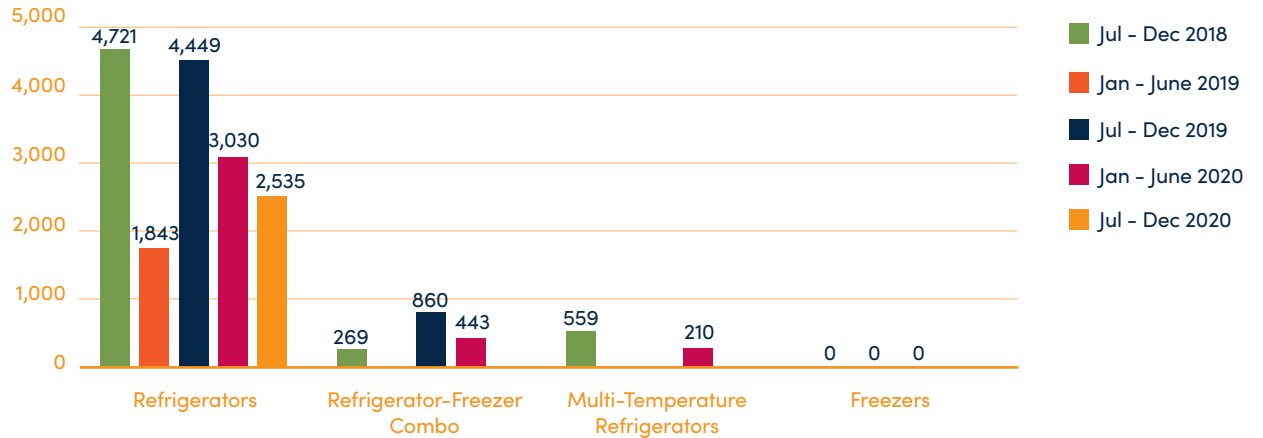
Figure 9 - Semi-annual Evolution for RUs - World



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 instalments over time or pays for use of the product as a service.

Figure 10 - Semi-annual Evolution of RUs by Product Category - World



Global Insights



Solar Water Pumps (SWPs)

SWPs experienced the largest relative increase amongst all appliance types, with a 134% increase of sales volumes compared to the first half of 2020, and 8,038 units sold, predominately in sub-Saharan Africa. Compared to the volumes recorded in the second half of 2019, sales of SWPs have decreased by 71% globally. Important to note here is that this drop can at least partly be attributed to lower participation of SWPs companies in the sales data collection for July - December 2020 (13) than for the one covering July - December 2019 (20). In the second half of 2019, sales of SWPs were boosted due to bulk procurements connected with government programs in South Asia, which have not materialized in 2020. The relatively low number of companies reporting means we currently have limited visibility on the sales volumes of solar water pumps on the global and regional level.

The high upfront costs of this technology still represent a barrier to mass uptake. **The price of SWPs varies widely depending on type and use case, but with an average retail price of US\$ 900 for surface pumps and US\$ 1,600 for submersible pumps, this product usually requires consumer financing.**²⁰ This is also visible in the sales data, as PAYGo sales represent 85% of total SWP sales.

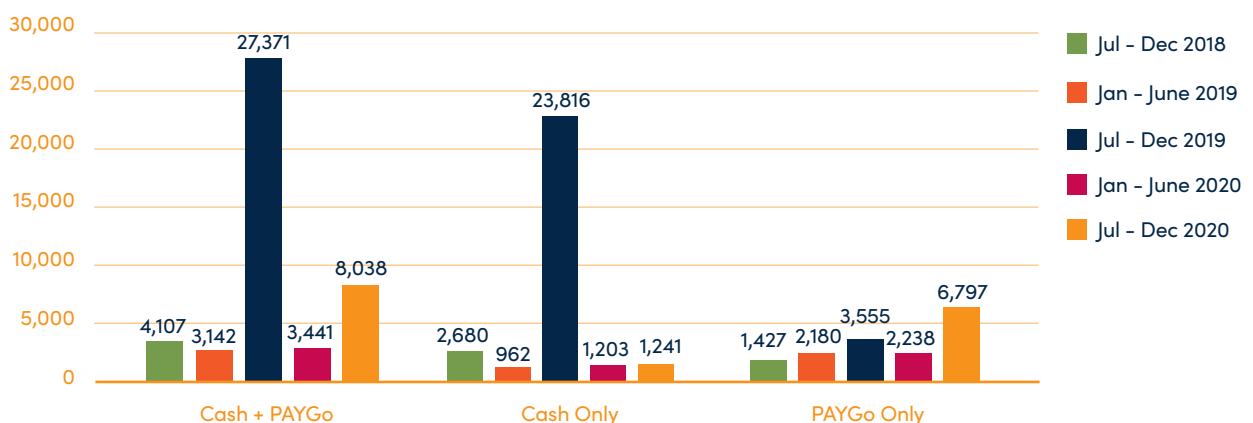
The 2019-20 Global LEAP RBF started in October 2019 and ended its current phase in December 2020, subsidizing the costs of SWPs in Kenya, Tanzania, Rwanda, Uganda, and Senegal.²¹ More support and schemes are due to come online to facilitate the distributions of these systems.

Other Appliances

Sales are also recorded for a wide variety of other solar-powered appliances which amount to around 14,000 units. Of these, over 13,800 have been sold via PAYGo channels and bundled with a power system. These units are not included under the 'All Appliances' category and include products such as agro-processing machines, air-conditioners, irons, hair clippers, stereos, sewing machines, egg incubators and other equipment. Currently, if separated, these volumes would not pass our three-data point rule in place to ensure confidentiality. For the time being, they will be reported together.

Radios are excluded from both 'All appliances' and 'Other Appliances', as they are regularly sold bundled with lighting systems and their large volumes would bias the overall results. **More than 204,000 radios were sold globally in the second half of 2020.** Companies anecdotally shared that customers valued radios more during lockdowns, as it helped them to stay informed and connected to others and the world.

Figure 11 - Semi-annual Evolution for 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 instalments over time or pays for use of the product as a service.

²⁰ Efficiency for Access Coalition (2021), 2021 Appliance Data Trends.

²¹ Global Leap Awards (2019), Results-based financing, 2019-20 - Refrigerators & Solar Water Pumps.

Global Insights

Table 2 - Sales of Off-Grid Solar Appliances per Region and Country

Region / Country	All Appliances	TVs	Fans	Refrigeration Units	Solar Water Pumps	Other Appliances
sub-Saharan Africa	280.936	233.345	37.164	3.049	7.378	14.025
East Africa	179.643	170.241	3.304	1.867	4.231	11.114
Ethiopia	859	602	0			
Kenya	138.936	132.466	1.852	1.229	3.389	2.522
Malawi	547	0		0		
Mozambique	968			14		0
Namibia	17	0	0			0
Rwanda	7.840	6.812				6.634
South Africa	394					0
Tanzania	18.170	18.087		38		789
Uganda	8.201	7.701		306	193	
Zambia	3.764	3.355			0	
Zimbabwe	274	0	0			0
West Africa	84.384	50.499	29.747	998	3.140	1.436
Benin	11.735					
Burkina Faso	1.259	956				
Cote d'Ivoire	12.900	11.339	1.499			
Ghana	5.573	2.813	2.704	6		0
Guinea	2.494		119		0	
Liberia	1.396				0	0
Mali	882	619			0	0
Niger	81	0		0		0
Nigeria	18.010	6.649	10.742	618		106
Senegal	12.884	6.958	5.743	7	176	
Sierra Leone	9.553		7.055	53		0
Togo	7.474		0	78		0
Central Africa	16.515		3.814	169		
Congo (DRC)	16.335				0	
Southern Africa	394					0
South Asia	178.745		177.936		616	0
Bangladesh	15.467	0				0
India	9.271		9.074			0
East-Asia & Pacific	4.818	3.583		278		0
Myanmar	368	0	368	0	0	0
Papua New Guinea	1.737					0
Latin America & Caribbean	1.213		710			0
Middle East & North Africa	3230	0				0

NOTE:

Note that only an excerpt of countries is included above, excluding all the countries showing 0 sales or not passing the three-data point rule for all appliances combined. When there are fewer than three responses, no results are shown to protect the proprietary interests of the companies who have supplied data in support of this industry report. While if there are no companies reporting data at all, the graph shows a value of 0.

Global Insights

Estimated Impact of Off-Grid Solar Lighting and Appliances²²



²² Impact estimates as of December 2020 for off-grid solar lighting and appliances products sold to date by participating affiliates calculated using GOGLA's [Standardised Impact Metrics for the Off-Grid Solar Energy Sector Version 4.0, 2020](#) and [Standardised Impact Metrics for High-Performing Appliances: Fans and TVs, Version 1, 2020](#).

²³ 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.

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Energy Access

There are just 10 years left to achieve SDG7 - affordable, reliable, sustainable and modern energy for all. Currently, off-grid solutions sold by affiliates are serving 105 million people and have benefitted nearly 350 million people since 2010. Of these, 57 million are currently accessing Tier 1 systems and 15 million are accessing larger SHS, Tier 2, solutions - an increase of almost a third since the end of 2019. However, 790 million people are still living in energy poverty, and population growth means that millions more will need to be reached by 2030.²⁴ **Despite off-grid solar solutions providing the fastest and most affordable way to electrify hundreds of millions of people, across 2020, the reversal in the growth of the off-grid solar market led to an estimated 10-15 million people missing out on improved energy access.**²⁵

The benefits of the sector getting back to growth, and towards the rates of acceleration needed to meet energy access targets, are myriad. A number of these economic, environmental and welfare benefits are highlighted below. These and wider impacts created by the off-grid sector should be

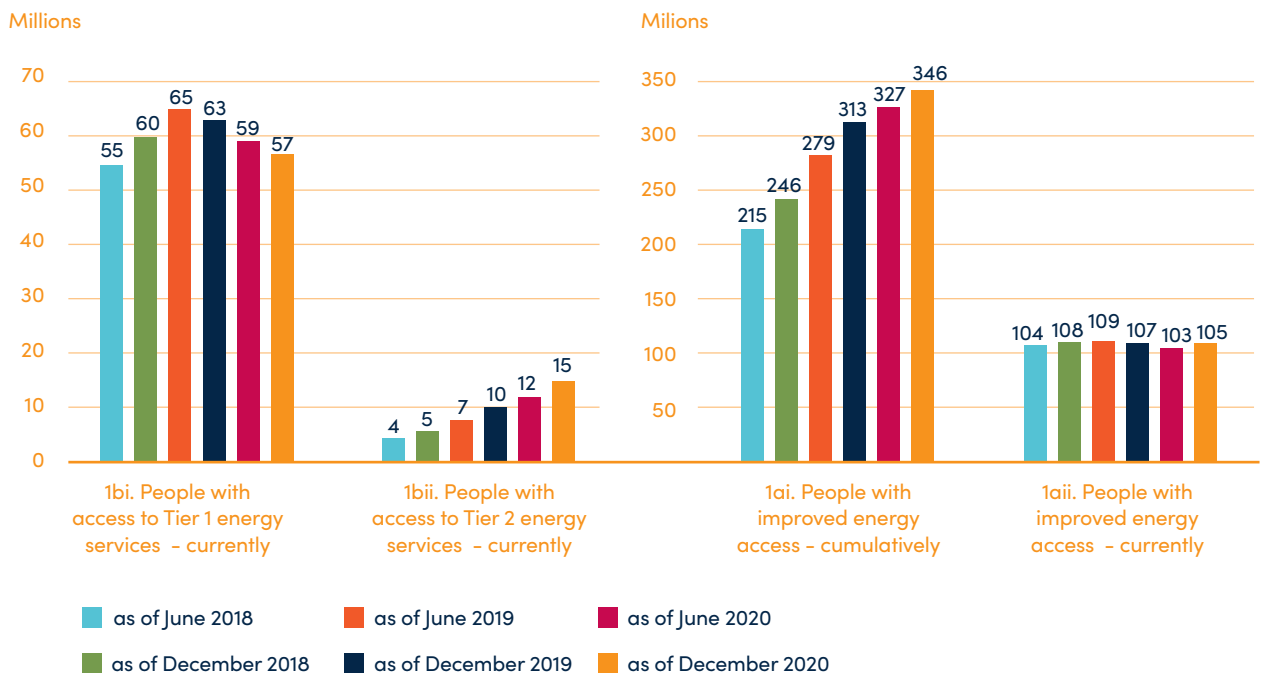
taken into account by policymakers, development actors and investors focused on boosting recovery from the COVID-19 pandemic, the green energy transition, and the welfare of the world's most vulnerable communities.

Economic Impacts of Off-Grid Solar

Five million people are undertaking more economic activity as a direct result of owning an off-grid solar system. These systems are estimated to have unlocked an additional US\$ 6.3 billion in income over the last 10 years. Coupled with the savings that smaller off-grid products, such as lanterns and multi-light kits, have created for households, the sector's benefit to the finances of millions of low-income households is over US\$ 18 billion.

In particular, off-grid solutions are boosting economic opportunity across rural and peri-urban communities. An estimated 2.7 million small and micro enterprises have been able to expand their services as a result of off-grid solar - the majority of which are based in rural regions.

Figure 12 - Semi-Annual Evolution of Energy Access (Tier 1 & 2 and total) - World



NOTE:

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.

²⁴ IRENA et al. (2020), *Tracking SDG 7: The Energy Progress Report 2020*.

²⁵ High level estimate based on access rates if sales numbers had been similar to numbers seen in 2019 (lower bound) or had risen by the same 13% increase as they did between 2018 and 2019 (upper bound), using the Standardised Impact Metrics.

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Yet the slowdown in sales in 2020 has also affected the number of people who have gained economic benefits from their system, missing a significant opportunity for off-grid solutions to create economic resilience and to help drive recovery from the pandemic. If the sales numbers had been similar to those seen in 2019, or the market had seen the same levels of growth between 2019 and 2020 as it did between 2018 and 2019, the estimated number of enterprises benefiting from off-grid solar solutions could have jumped by an additional 300,000 – 450,000.²⁶

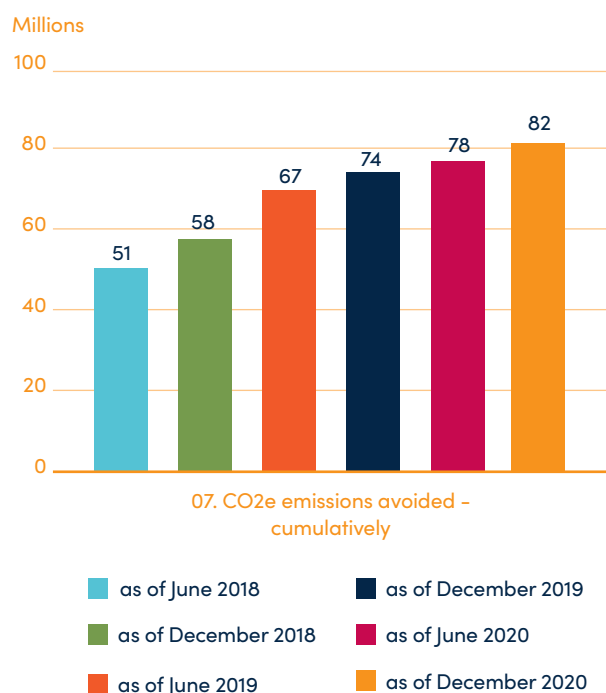
Environment & Air Pollution

As with economic impact, the growth in greenhouse gas reductions created by the sector has also slowed. However, this has still taken the total CO₂e emissions avoided since 2010 (across product lifetime) to almost 82 million metric tons.²⁷ **This is equal to the emissions avoided by taking 21 coal power plants off-line for a year.** Emissions reductions also have critical health benefits. Most 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^{28&29} and that it has the most damaging effects on women and children. Removing kerosene pollution from homes significantly improves air quality and health.

New data is also available on the emissions avoided by the use of off-grid televisions and fans. Although these products commonly provide an additional rather than replacement energy service, where solar powered TVs and fans replace those that are being powered by diesel generators, valuable benefits are seen.

Emissions avoided by high-performing fans and televisions since July 2018 are already over 11,000 metric tons. This is equivalent to the carbon sequestered over 10 years by planting 180,000 trees.³⁰

Figure 13 – Semi-Annual Evolution of CO₂e Emissions Avoided Cumulatively – World



Light Use & Quality

As noted in previous reports, the continued access to more efficient and more affordable energy solutions continues to increase the light use and quality provided by the off-grid sector. When compared to previously used lighting products, such as kerosene or candles, the average increase in lumens – the measure of brightness – available to households is now close to 200 lumens rather than 25 from kerosene lamps or 12 from candles.

Access to High-Performing Televisions

For the first time, the impact of high performing off-grid televisions and fans has been captured through the development of standardized impact metrics for these appliances, with support from the Efficiency for Access coalition. An estimated 3.7 million people are currently benefiting from the use of off-grid televisions, with more than 70,000 people using their TV to support an enterprise.

The importance of access to television and other communication devices, such as radios and mobile phones, has also been spotlighted by the COVID-19

²⁶ High level estimate based on access rates if sales numbers had been similar to numbers seen in 2019 (lower bound) or had risen by the same 13% increase as they did between 2018 and 2019 (upper bound), using the Standardised Impact Metrics.

²⁷ United States Environmental Protection Agency (2021), Greenhouse Gas Equivalencies Calculator.

²⁸ Pokhrel et al. (2010), Tuberculosis and Indoor Biomass and Kerosene Use in Nepal: A Case-Control Study.

²⁹ Bates et al. (2013), Acute Lower Respiratory Infection in Childhood and Household Fuel Use in Bhaktapur, Nepal.

³⁰ United States Environmental Protection Agency (2021), Greenhouse Gas Equivalencies Calculator.

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pandemic. Solar powered televisions are playing a critical role in enabling households to access health information and news. With 90% of off-grid TV customers reporting that their knowledge or awareness of current affairs, politics, and general knowledge has improved.³¹ In addition, televisions and radios also provide access to vital educational resources. The strong majority of off-grid TV sales are in sub-Saharan Africa (98%), where lockdown related school closures have impacted 250 million children.

Access to High-Performing Fans

This report reveals the impact of high-performing fans, which are currently benefiting over 5 million

people and are being used to support more than 30,000 businesses.

In contrast to television sales, the vast majority of fan sales are in South Asia (81%) where average summer temperatures are over 35 degrees Celsius and can exceed 50 degrees Celsius. Fans play a critical role in cooling for health and comfort, keeping body temperature at a safe level and reducing fatigue. Research from Bangladesh found that 92% of off-grid fan customers observed improvement in their family's health, and that - on average - fans extended customer's productive time by more than two hours.³²

Table 3 - Global Impact by Product Category - Lighting

Product Categories	Number of People with Improved Energy Access - Cumulatively	Number of People with Improved Energy Access - Currently	Number of People with Access to Tier 1 Energy Services - Currently	Number of People with Access to Tier 2 Energy Services - Currently
All Categories	346 million	105 million	57 million	15 million
0-1.5 Wp	146.4 million	28.7 million	6.6 million	-
1.5-3 Wp	133.8 million	37.8 million	29.4 million	-
3-10 Wp	41.6 million	17.8 million	15 million	1.5 million
11-20 Wp	7.6 million	5.5 million	5.2 million	0.005 million
21-49 Wp	6.2 million	5.6 million	0.8 million	4.5 million
50-100 Wp	6.7 million	6.4 million	0.02 million	6.1 million
100+ Wp	3.4 million	3 million	-	3 million

Product Categories	Number of People Undertaking More Economic Activity - Currently	Number of People Using Products to Support Enterprise - Currently	Number of People that Spend More Time Working - Currently	Additional Income Generated - Cumulatively
All Categories	5 million	2.7 million	2.7 million	US\$ 6.3 billion
0-1.5 Wp	0.8 million	0.6 million	0.3 million	US\$ 1.5 billion
1.5-3 Wp	1.1 million	0.8 million	0.4 million	US\$ 1.4 billion
3-10 Wp	1.6 million	0.8 million	1 million	US\$ 2 billion
11-20 Wp	0.4 million	0.2 million	0.3 million	US\$ 0.4 billion
21-49 Wp	0.4 million	0.2 million	0.3 million	US\$ 0.3 billion
50-100 Wp	0.4 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

Table continues on next page >

31 Efficiency for Access and 60 Decibels (2020), The Use and Impact of Solar TVs.

32 Efficiency for Access Coalition (2020), The Socio-Economic Impact of Super-Efficient Off-Grid Fans in Bangladesh.

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Product Categories	Additional Light Hours Used - Cumulatively	Additional Light Hours Used - Household	Change in Quality of Life (lumen / hours) - Household
All Categories	86.1 billion	1.6	193
0-1.5 Wp	35.1 billion	1.509	-9
1.5-3 Wp	32.2 billion	1.546	50
3-10 Wp	9.7 billion	1.388	151
11-20 Wp	2.1 billion	1.454	314
21-49 Wp	1.9 billion	1.526	837
50-100 Wp	3.5 billion	2.574	489
100+ Wp	1.8 billion	2.628	2.018

Product Categories	Savings on Energy Expenditures - Cumulatively	Savings on Energy Expenditures - Household	Kerosene Lanterns Replaced - Currently	CO2e Emissions Avoided - Cumulatively
All Categories	US\$ 12 billion	US\$ 183	21.2 million	81.6 million
0-1.5 Wp	US\$ 6.2 billion	US\$ 186	6.1 million	34 million
1.5-3 Wp	US\$ 4.7 billion	US\$ \$174	7.9 million	30 million
3-10 Wp	US\$ 1.2 billion	US\$ \$198	3.3 million	9.5 million
11-20 Wp	\$-	\$-	1.1 million	2.1 million
21-49 Wp	\$-	\$-	1.1 million	1.8 million
50-100 Wp	\$-	\$-	1.1 million	2.7 million
100+ Wp	\$-	\$-	0.6 million	1.5 million

NOTE:

- Impact is estimated using the GOGLA Standardised 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 0-1.499 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.

Table 4 - Global Impact by Product Category - Appliances

Product Categories	Number of People Benefitting from High-performing Appliances - Cumulatively	Number of People Benefitting from High-performing Appliances - Currently	Number of People Using their Appliances to Support Enterprise	Number of People Generating Additional Income	Metric tons of CO2e Emissions Avoided, from Diesel Displacement
TVs	3.72 million	3.68 million	71.800	31.900	7.500
Fans	5.86 million	5.14 million	29.500		4.400

NOTE:

- Impact is estimated using the [Standardised Impact Metrics for High-Performing Appliances: Fans and TVs, Version 1, 2020](#) developed by GOGLA and the Efficiency for Access Coalition. 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.
- The metric 'Number of People Generating Additional Income' is currently only available for TVs.



**East
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Sales Trends

Off-Grid Solar Lighting Products

Sales of off-grid solar lighting products in East Africa between July - December 2020 totaled 2.2 million units. This is a 41% increase compared to the first half of 2020 and a 10% decrease compared to the second half of 2019.

Both cash and PAYGo sales increased. Around 1.3 million units were sold on a cash basis, with a total value of US\$ 31.78 million. This is a 61% increase in volumes compared to the first half of 2020 and 14% less than the second half of 2019. Conversely, in the second half of 2020, 876,000 units reportedly sold via PAYGo, with a total value of US\$ 134 million. This is 19% more in sales volume compared to the last reporting round, and showing a similar number of sales as the second half of 2019.



Portable Lanterns

Sales of portable lanterns reached over 1.43 million units in East Africa, at 65% of the region's total sales. Affiliates reported sales of 660,000 units of portable lanterns without mobile charging - i.e. those with an indicative wattage of 0-1.499 Wp. This is a significant 77% increase compared to the first half of 2020 and a 16% drop compared to the second half of 2019. Portable lanterns capable of charging mobile phones - i.e. those with an indicative wattage of 1.5-2.999 Wp - also experiences an increase of 42% with sales of 772,000 units compared to the first half of 2020 and a 12% increase compared to the second half of 2019.



Multi-light Systems

East Africa recorded around 388,000 units of multi-light systems sold between July and December 2020, representing 18% of all regional sales. This product category increased 30% compared to the first half of 2020 and shrank 30% in comparison with the volumes recorded in the second half of 2019.



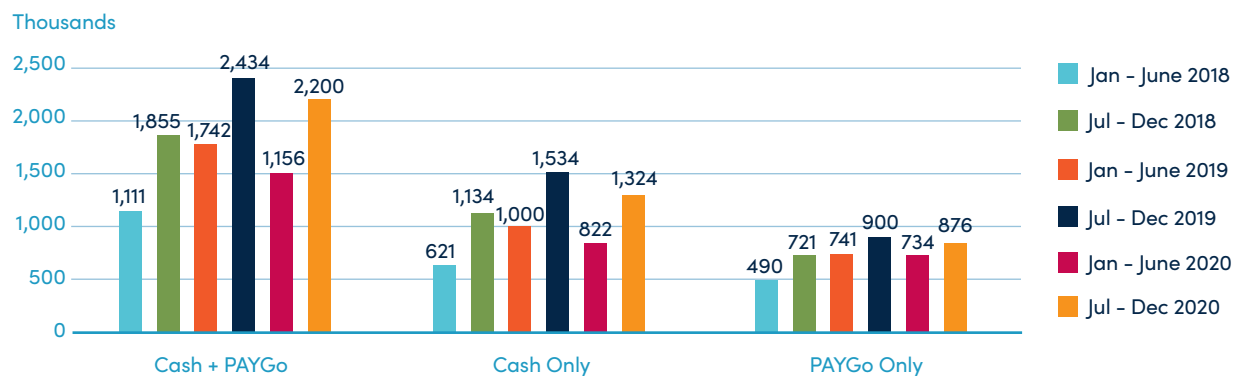
Solar Home Systems (SHS)

Over 379,000 SHS were sold in East Africa in the second half of 2020. This is an 11% increase compared to the second half of 2019, but a 5% decrease compared to the second half of 2019.

The 21-49 Wp remains the best-selling SHS category in the region at over 151,000 units, remaining stable compared to the last reporting round. The 11-20 Wp category recorded 138,000 units sold in East Africa, a significant 43% increase compared to the first half of 2020. Meanwhile, sales of the 100+ Wp saw the largest relative decrease of 31%, falling to 5,000 units.

Sales in the 50-100 Wp category were similar to last round, with a slight 3% decrease compared to the first half of 2020. This is still a 48% increase compared to the second half of 2019. A possible explanation for this, cited by companies in the

Figure 14 - Semi-annual Evolution of Volume of Lighting Products Sold - 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 instalments over time or pays for use of the product as a service.

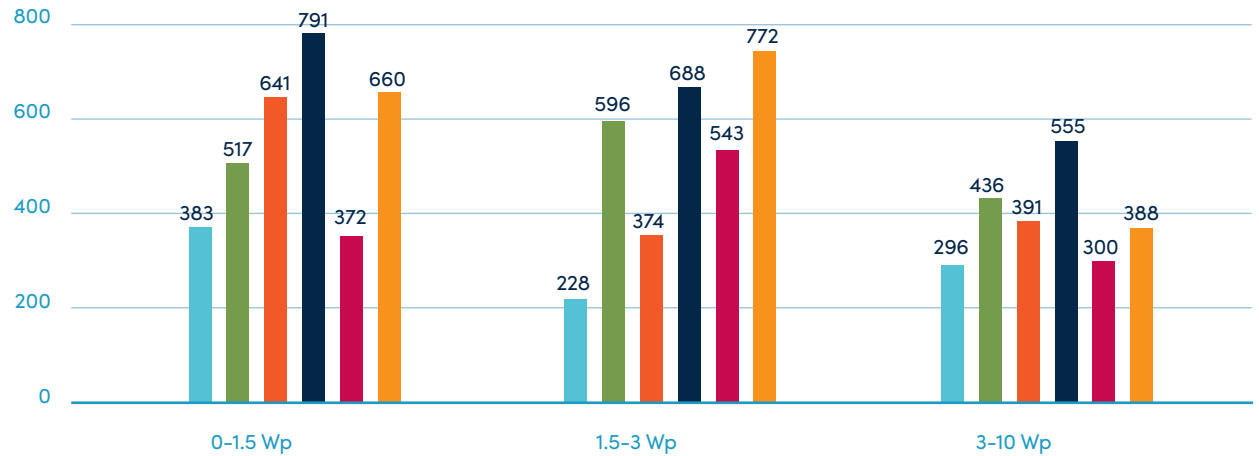
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region, is that this SHS size became popular amongst wealthier customers who wanted to purchase a backup power source to have at

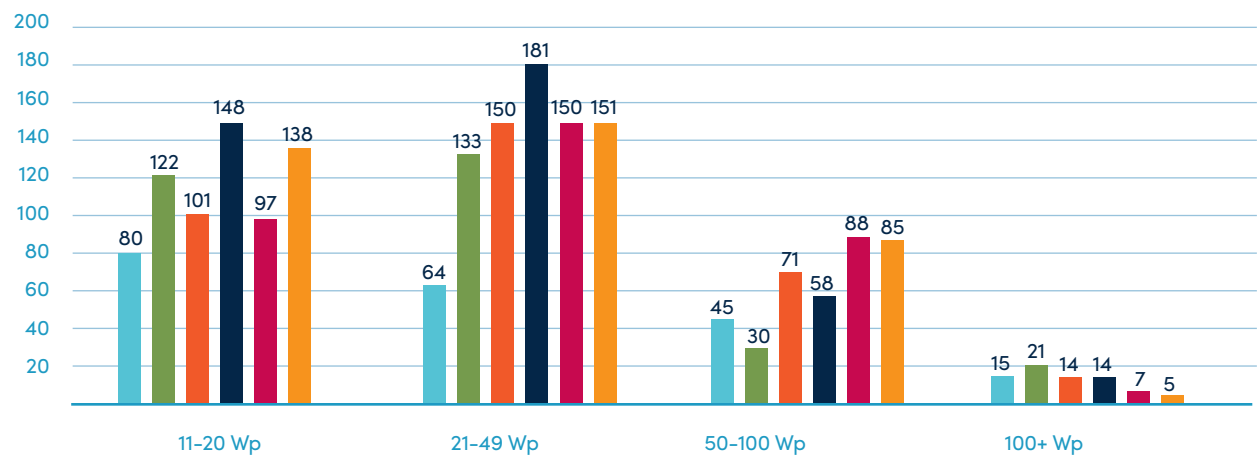
home during lockdown in the first half of last year. The minor decrease indicates that this product category remained popular throughout the year.

Figure 15 - Semi-annual Evolution of Global Sales Volumes by Product Category - East Africa

Thousands



Thousands



■ Sum of Jan-June 2018 ■ Sum of Jan-June 2019 ■ Sum of Jan-June 2020
■ Sum of Jul-Dec 2018 ■ Sum of Jul-Dec 2019 ■ Sum of Jul-Dec 2020

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.

East Africa Insights

Off-Grid Solar Appliances

Between January and June 2020, the total recorded number of appliance sales in East Africa reached 180,000 units. This is a 9% increase compared to the first half of 2020, but a 5% decrease compared to the second half of 2019.

Appliance sales in East Africa represent 64% of total appliance sales in sub-Saharan Africa (SSA).

TVs sold in East Africa account for 73% of total TV sales in SSA with 170,000 units. Refrigerator units (RUs) and solar water pumps (SWPs) represent 61% and 57% of total SSA sales, with 1,867 and 4,231 units, respectively. Sales of fans remain marginal at 9% with 3,304 units.

We do not have visibility on the volume of TV or fan sales outside of this report, but anecdotal reports on SWPs indicate significant volumes are being sold through traditional component-based solar and agricultural equipment retail channels. Meanwhile, the opposite can be observed for RUs, with very few being sold in commercial markets for off-grid use.

Since October 2019, one factor that has positively influenced the PAYGo segment for SWPs and RUs in Kenya, Tanzania, Rwanda, Uganda and Zambia are the 2019-20 Global LEAP RBF incentives.³³



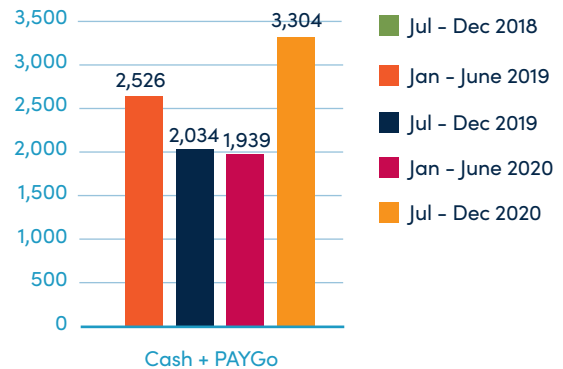
Fans

Sales of fans increased considerably in East Africa to 3,304 units in July - December 2020. This is an increase of 70% compared to the first half of 2020

and a 62% increase compared to the second half of 2019. This region's demand for fans is smaller compared to South Asia or West Africa. 70% of fans were sold together with a power system this round compared to 35% in the first half of 2020. These percentages will be monitored over time to observe whether fans are increasingly sold bundled with a SHS or not.

Given the limited sales volumes, the three-data point rule does not allow us to reveal the split between cash and PAYGo, nor the breakdown between product categories in East Africa.

Figure 17 - Semi-annual Evolution for Fans - East Africa

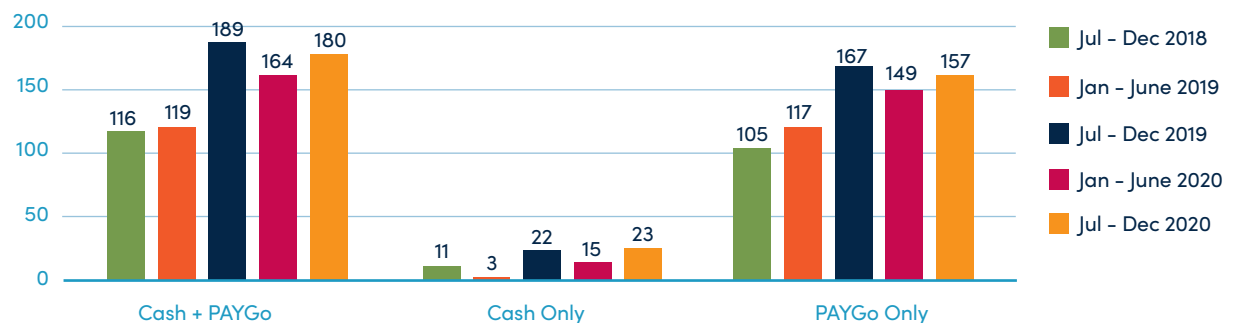


NOTE:

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 instalments over time or pays for use of the product as a service.

Figure 16 - Semi-annual Evolution for All Appliances - East Africa

Thousands



NOTE:

- The category 'All 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 instalments over time or pays for use of the product as a service.

East Africa Insights



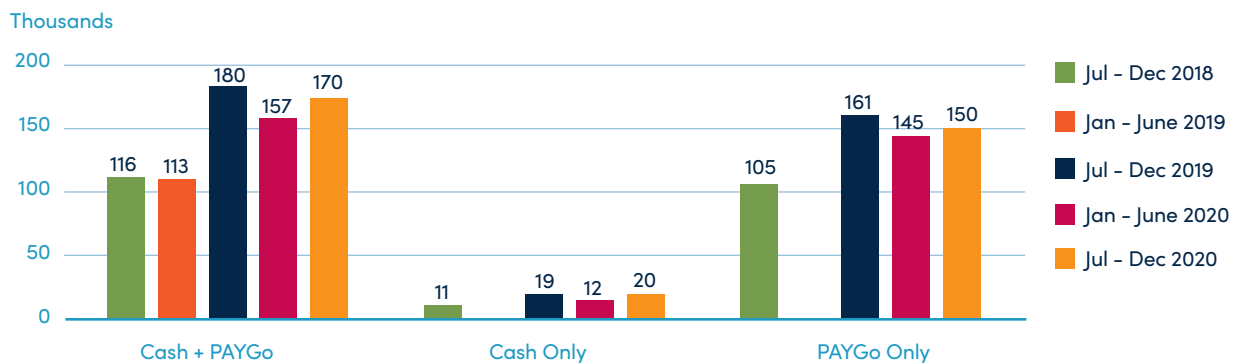
TVs

East Africa remained the largest regional market for TVs. Affiliates sold 170,000 TVs in the second half of 2020, showing an 8% increase compared to the first half of 2020, and a 6% decrease compared to the second half of 2019. Anecdotally, companies reported that the sales of TVs did not experience a significant dip last year because customers valued the ability to access entertainment and information, especially during the lockdown periods.

88% of TVs were sold via PAYGo, accounting for 150,000 units, as opposed to only 20,000 units sold in cash. This is largely due to the high level of bundling with SHS in East Africa, with 82% of products reported as being sold with a power system.

In terms of the diversity of product categories, the greatest share of TVs sold (49%, at 84,000 units) are large, meaning the TV has a display size between 24" and 29". Extra-large and medium TVs follow with over 50,000 and 36,000 units sold, respectively. Notably, extra-large TVs pass the 50,000 mark for the first time, which can partly be explained by decreasing prices,³⁴ wealthier customers purchasing SHS bundled with extra-large TVs during lockdown periods, and the very limited difference in power consumption between large and extra-large TVs. Sales of small TVs do not pass three-data point control, meaning that only a few affiliates are actively selling products in that category in East Africa.

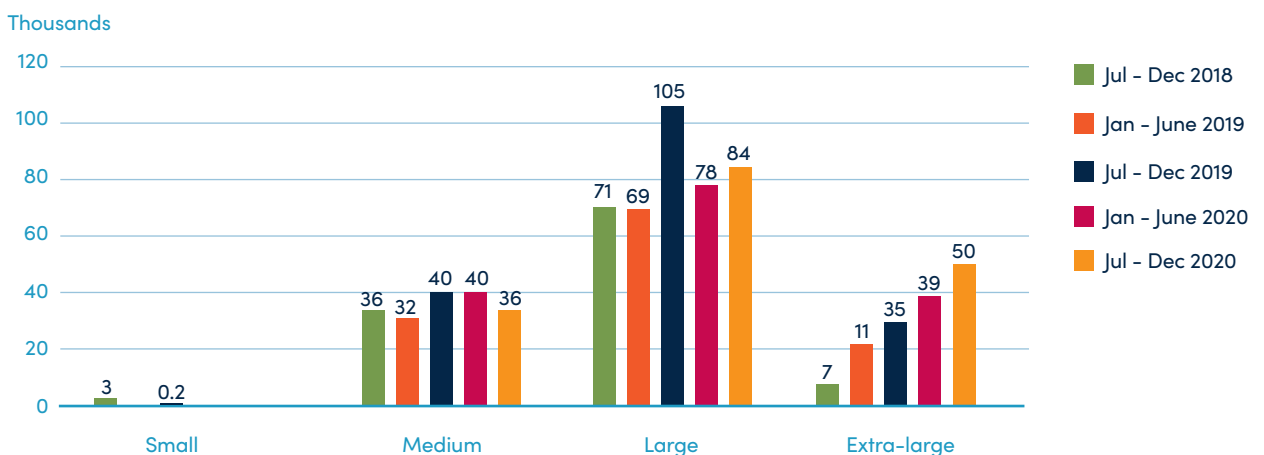
Figure 18 - Semi-annual Evolution for TVs - East Africa



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 instalments over time or pays for use of the product as a service.

Figure 19 - Semi-annual Evolution of TVs by Product Category - East Africa



East Africa Insights



Refrigeration Units (RUs)

In East Africa, RUs are the only appliance type that experienced a considerable decrease in sales. Between July and December 2020, 1,867 units were sold, which is a 28% decrease compared to the first half of 2020, and a 25% decrease compared to the second half of 2019. This decreasing trend was present in the last round; however, it was then obscured by new participation from companies in this segment.

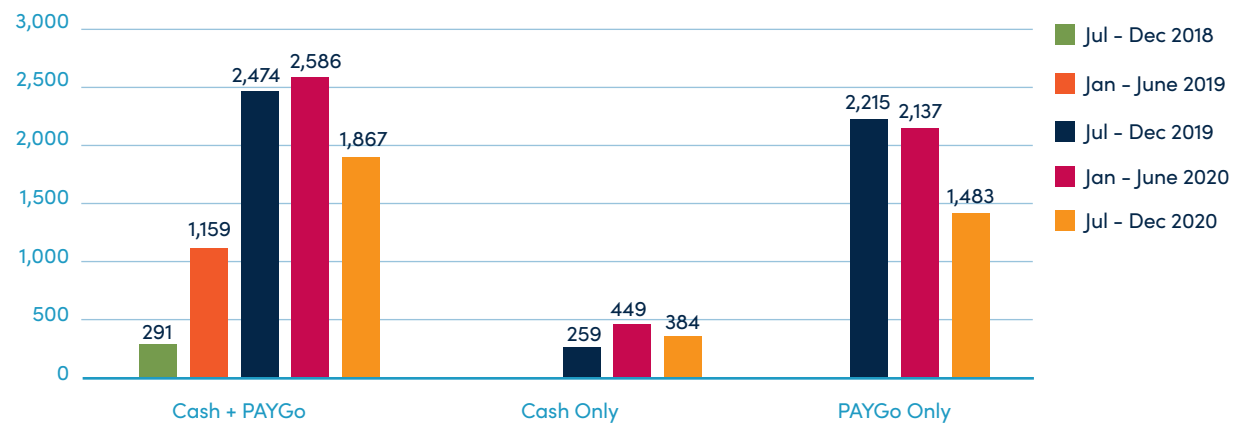
In East Africa, most RUs sales - 1,483 - were sold via PAYGo. Cash sales remain marginal with less than 400 units.

RUs are reported to be sold bundled with a power system 67% of the time in East Africa, while this was 40% in the first half of 2020. This may not

reflect a market trend, and it may be specific to the B2B manufacturing companies reporting sales in this segment which are selling the RUs to a local distributor, which then sell it to the end-user together with a panel and battery. These percentages will be monitored over time to observe whether RUs are increasingly sold bundled with large SHS.

In terms of product category diversity, refrigerators command the largest percentage of sales. They represent 91% of the sales in East Africa. Sales in the refrigerator-freezer combo category, as well as sales for multi-temperature refrigerators and freezers did not pass the confidentiality rule, meaning the data for these categories cannot be shared.

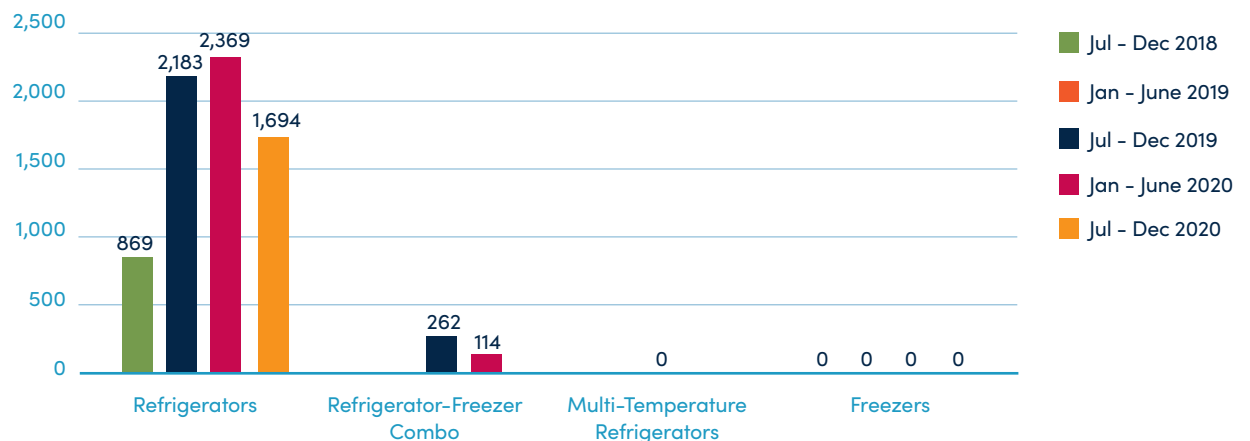
Figure 20 - Semi-annual Evolution for RUs - East Africa



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 instalments over time or pays for use of the product as a service.

Figure 21 - Semi-annual Evolution of RUs by Product Category - East Africa



East Africa Insights



Solar Water Pumps (SWPs)

SWPs experienced the largest relative increase, together with fans, amongst all appliance types in East Africa, with 4,231 units sold. This is a 70% increase compared to the first half of 2020, and half of the global volume of sales. Similar volumes were sold in the second half of 2019. Sales of SWPs follow a seasonal pattern in East Africa, with higher sales in the second half of the year due to the dry season from June to October.

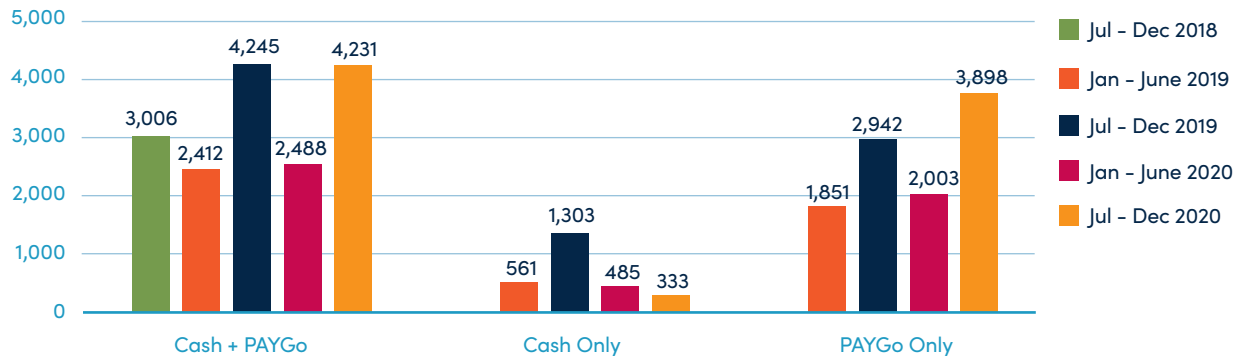
In East Africa, the majority of SWPs, 92% of the total, sold via PAYGo. Affiliates reported that 97% of this appliance type are sold bundled with a power system. Given the larger investment required to purchase both the appliance and the power system, it seems logical that customers require some form of consumer financing, such as PAYGo.

Other Appliances

Sales were reported for a wide variety of other solar-powered appliances, amounting to around 11,100 units in East Africa. These include agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Of these, 10,900 or 98% have been sold bundled. East Africa is the largest market for the sale of these other appliances, constituting 79% of the globally reported 14,000 units. These units are not represented in the 'All Appliances' numbers above.

Radios are excluded from both 'All Appliances' and 'Other Appliances', as they are regularly sold bundled with lighting systems and their large volumes would bias the overall results. **More than 140,000 radios were sold in East Africa in the second half of 2020.**

Figure 22 - Semi-annual Evolution for SWPs - 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 instalments over time or pays for use of the product as a service.

East Africa Insights



Ethiopia Insights

In July, the World Health Organization stated that Ethiopia was one of ten African countries accounting for 88% of all reported COVID-19 cases in the African region. The number of cases were on a downward trend in the second half of 2020, yet travel restrictions and lockdowns were imposed in regions such as Amhara, Oromia and Afar.

In addition to the public health crisis, the political situation in Ethiopia remains volatile with civil unrest often leading to partial lockdowns affecting sales in certain regions. The civil war between the Government of Ethiopia and the Tigray People's Liberation Front in the Tigray region has further destabilized the country. Tigray is one of the key markets for off-grid solar companies.

Off-grid solar companies were not recognized for delivering an essential service in Ethiopia, but the

government did launch various fiscal measures to support the private sector, such as the accelerated processing of VAT refunds and tax exemptions on products related to curbing the COVID-19 pandemic.

Accessing forex to import products has always been a bottleneck in Ethiopia, and little funds were left in the Ethiopian Government's facility at the Development Bank of Ethiopia (DBE), funded by the World Bank, to be disbursed in 2020, as most of the funds were used in 2019.

On a positive note, off-grid solar companies were able to access grant funding through the 'REACT Household Solar Program' by the Africa Enterprise Challenge Fund (AECF) in the second quarter of 2020, which likely positively affected the sales of those players in the second half of 2020.³⁵



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35 For more information, please see [AECF \(2020\), REACT Household Solar Program](#).



Ethiopia Insights

Sales Trends

Off-Grid Solar Lighting

Sales of off-grid solar products in Ethiopia totaled 371,000 units sold between July - December 2020. This represents a 58% increase compared to the first half of 2020 and a 48% drop from to the second half of 2019. Sales in July - December 2019 were particularly high. This means that comparisons with the first half of 2019 may be more appropriate. Compared to that period, sales increased by 28%.

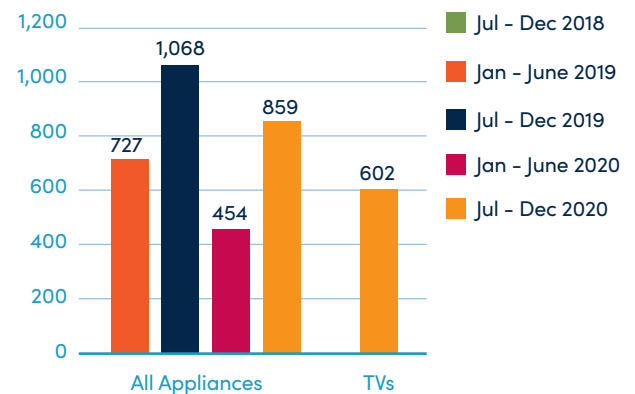
Both cash and PAYGo sales increased. Around 326,000 units were sold on a cash basis - a 56% increase compared to the first half of 2020 and 51% less than the second half 2019. In the second half of 2020, 45,000 PAYGo units were sold - a 73% increase in volumes compared to the last reporting round and a 24% drop compared to sales volumes in the second half of 2019. Compared to the first half of 2019, cash sales increased 30% and PAYGo sales remained relatively stable.

Off-Grid Solar Appliances

Between July and December 2020, the total recorded number of appliance sales in Ethiopia were 859 units. This is an 89% increase compared to the first half of 2020 and a 20% drop compared to the second of 2019. TVs are the most common appliance, with 602 units sold. Given the small

volumes recorded, it is not possible to offer a breakdown of other appliance types for Ethiopia, while it is visible that the recorded sales for fans were 0 in this reporting round.

Figure 24 - Semi-annual Evolution for Appliances Products - Ethiopia

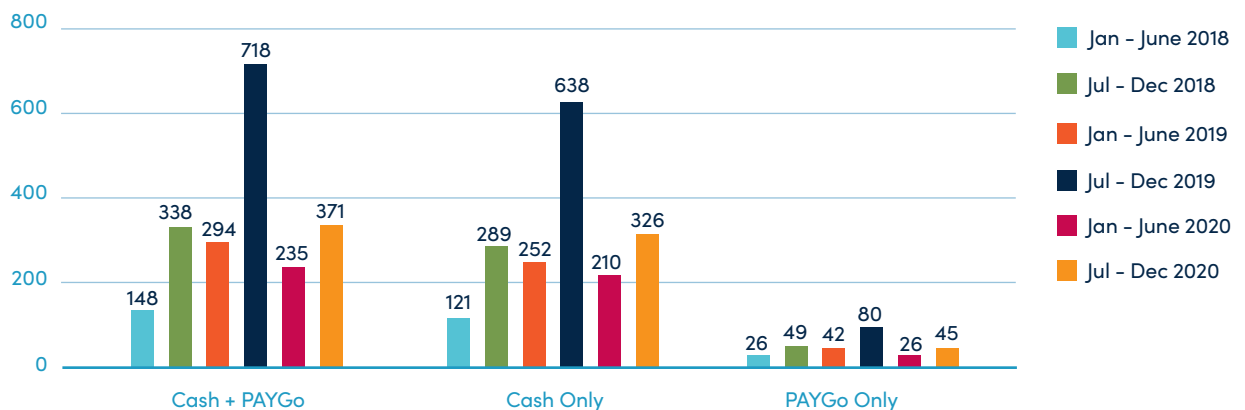


NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliance types that passed three-data point control any of the rounds are included in the figure.

Figure 23 - Semi-annual Evolution of Volume of Lighting Products Sold - Ethiopia

Thousands



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 instalments over time or pays for use of the product as a service.



Kenya Insights

Background

Kenya experienced one of the most stringent lockdowns in the region. A nationwide curfew was introduced along with a ban on public gatherings. From July onwards, the government implemented a phased reopening of public places, and international flights resumed in August. Early in the pandemic, the government of Kenya recognized energy as an essential service, including off-grid solar companies and mini-grid operators, which allowed companies to continue operations.

As a result of the pandemic and the government measures, the Kenyan Shilling continued on its downward trend and experienced a devaluation against the dollar, hitting an all-time low in August 2020. This may be affecting companies' liquidity, especially for those servicing debt finance in foreign currency.

An important regulatory change was the re-introduction of a 14% VAT on off-grid solar products in July 2020, rising to 16% in January 2021.³⁶ While total sales in the country have grown slightly this round compared to the second half of 2019, industry experts have expressed concerns about the effects of the tax increase on long-term market growth.

Given the significant increase in awareness of the off-grid sector in 2020, with President Kenyatta launching the industry's bi-annual forum in Nairobi in February, extensive national media focus and

the launch of the second window of the Kenya Off-Grid Solar Access Project (KOSAP) results-based financing scheme (RBF) in September, sector stakeholders had expected to see strong growth in the Kenyan market. However, sales were only up 4% when compared to the second half of 2019 and all growth was in the smallest market segment of portable lanterns. This suggests that the challenge of affordability, due to the pandemic and increased VAT costs, led to dampened growth, and increased sales in only the smallest product categories.

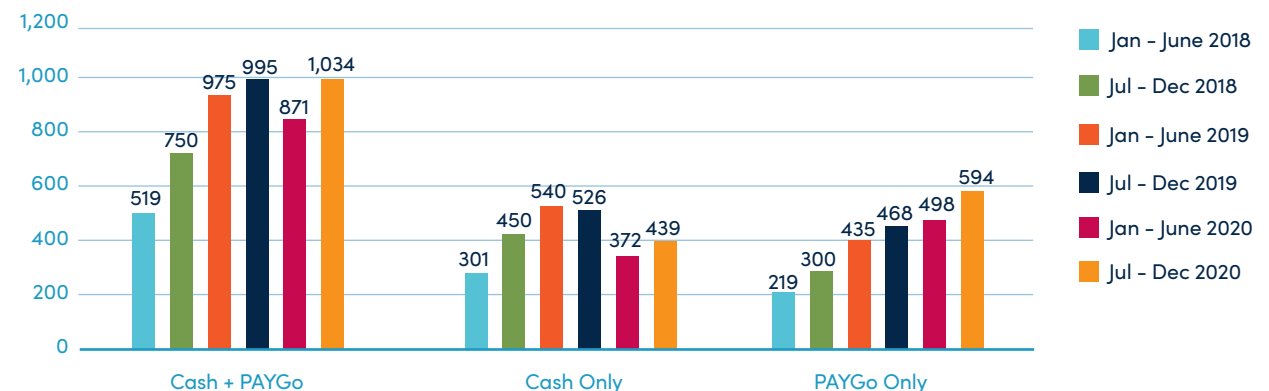
Sales Trends

Off-Grid Solar Lighting

Sales of off-grid solar products in Kenya totaled 1,03 million units between July and December 2020. This is a 19% increase in sales volumes compared to the first half of 2020 and 4% increase compared to the second half of 2019. Around 439,000 units were sold on a cash basis – an 18% increase compared to the first half of 2020 and 12% less than the second half of 2019. PAYGo sales also increased with 19% to 594,000 units, marking a 20% increase compared to the second half of 2019.

As noted above, the overall increase has been driven by growth in the portable lantern segment. Sales of multi-light systems have been on a downward trajectory from 108,000 in the second half of 2019 to 74,000 units in the second half of 2020. Sales of SHS have plateaued around 250,000 units during the same period.

Figure 25 - Semi-annual Evolution of Volume of Lighting Products Sold - Kenya



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 instalments over time or pays for use of the product as a service.



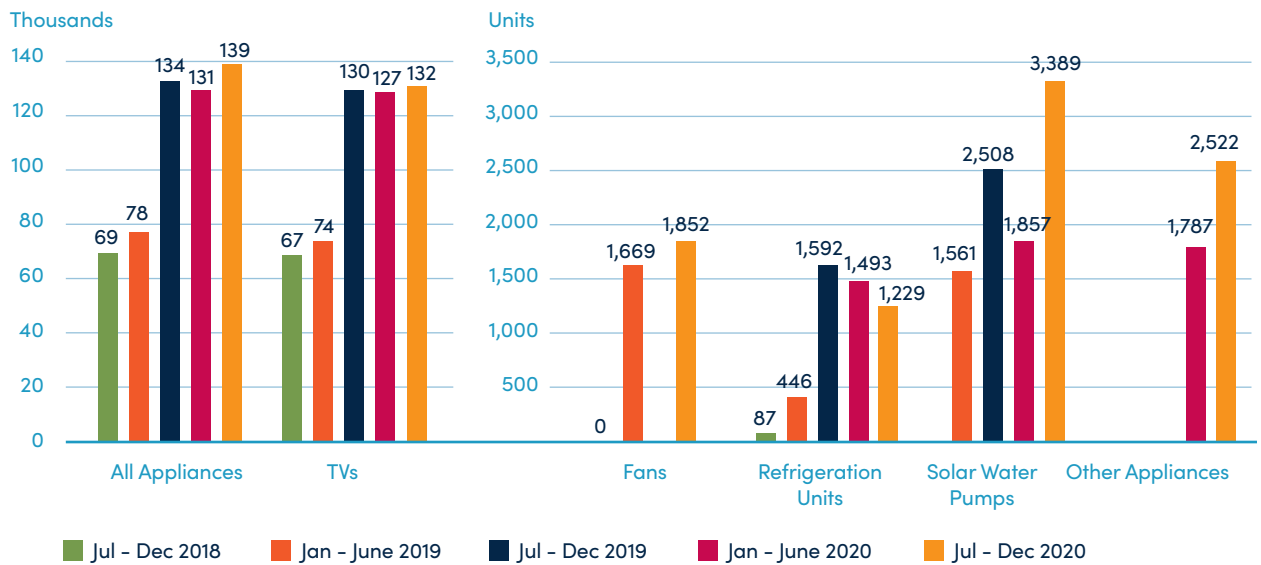
Kenya Insights

Off-Grid Solar Appliances

Between July and December 2020, the total recorded number of appliance sales in Kenya was 139,000 units. This is a 6% increase compared to the first half of 2020 and comparable to the second half of 2019. TVs account for 95% of the total appliances sold in the country, seeing roughly the same volumes as in the first half of 2020 and the same period in 2019. 1,852 fans were sold this sales

period, though there is no comparable data as there is no visibility on the sales of fans in the last two reporting rounds. RUs decreased with 1,229 products sold, a drop of 18% compared to the first half of 2020, and 23% lower compared to the second half of 2019. SWPs experienced the largest increase (82%) with 3,389 units sold. These volumes are also 35% higher than the second half of 2019. Over 2,500 units of other appliances were sold in Kenya.

Figure 26 - Semi-annual Evolution for Appliances Products - Kenya



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliances types that passed three-data point control any of the rounds are included in the figure.



Rwanda Insights

Background

Following the outbreak of COVID-19 the Rwandan economy experienced its first economic recession since 1994. While the gross domestic product (GDP) was estimated to grow by 8% pre-COVID-19, the public health crisis slowed the economic expansion dramatically, and the economy contracted by around 0.2% in 2020.

This dire economic situation has adverse implications for households, as a large part of the population are now faced with unemployment, income loss and increased prices of consumer goods. As a result, the number of people living in poverty is expected to rise by 5.1% (550,000 people) in 2021. Studies by the World Bank indicate that especially rural communities and women are affected by these developments.³⁷

The Rwandan government did not designate off-grid solar as an essential service officially. However, companies were generally allowed to keep their call centers and stores working with few staff members, in response to requests by the sector.

Beyond the COVID-19 crisis, sales in Rwanda are still being affected by uncertainty surrounding the 2019 Ministerial Guidelines around the minimum standards for imported SHS, causing difficulties and delays for companies importing SHS. Last reporting round, Lighting Global supported the government of Rwanda to develop a calculation tool for the private sector to determine whether

products meet minimum requirements. However, the success in fully resolving the previous uncertainty remains to be clarified.

Following the successful 'Pro Poor Results-Based Financing' (RBF) scheme led by Energizing Development (EnDev), the government of Rwanda launched a nationwide SHS subsidies scheme to scale-up off-grid electrification in October 2020.

The scheme, which is supported by the World Bank through the Renewable Energy Fund (REF) Project, leverages donor investments to incentivize off-grid solar companies to work in more remote and low-income areas, with the provision of targeted subsidies of US\$ 30 million to households and companies.

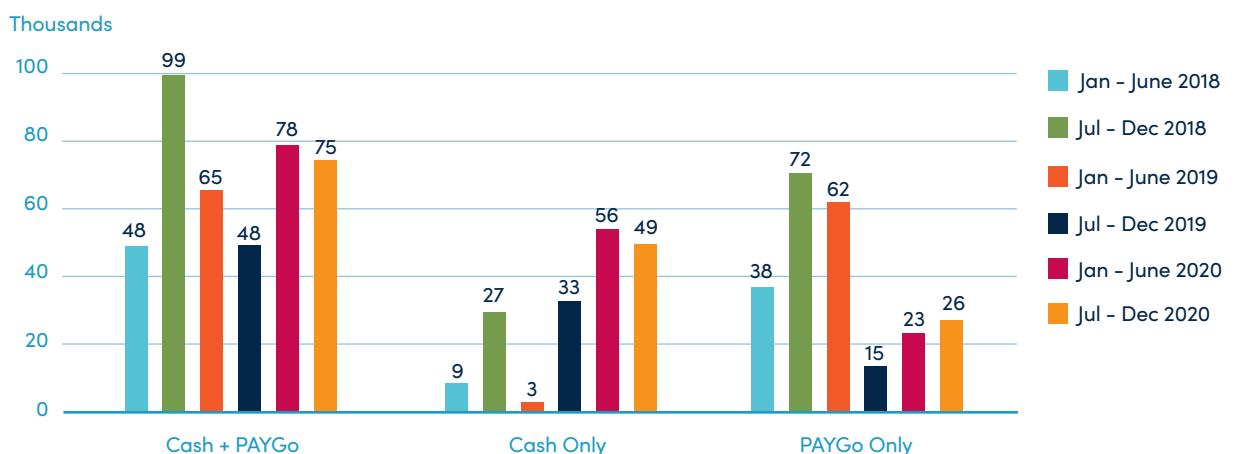
Sales Trends

Off-Grid Solar Lighting

Sales of off-grid solar products in Rwanda totaled 75,000 units between July and December 2020. This is a 4% decrease compared to the last reporting round, but a 56% increase compared to the second half of 2019.

The decrease occurred in cash sales, while sales via PAYGo saw an increase. Around 49,000 units were sold on a cash basis – a 13% decrease compared to the first half of 2020 but still a 49% increase compared to the second half of 2019. PAYGo sales increased 17% compared to the last reporting round to 26,000 units, while posting a 71% increase compared to the second half of 2019.

Figure 27 - Semi-annual Evolution of Volume of Lighting Products Sold - Rwanda



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 instalments over time or pays for use of the product as a service

East Africa Insights



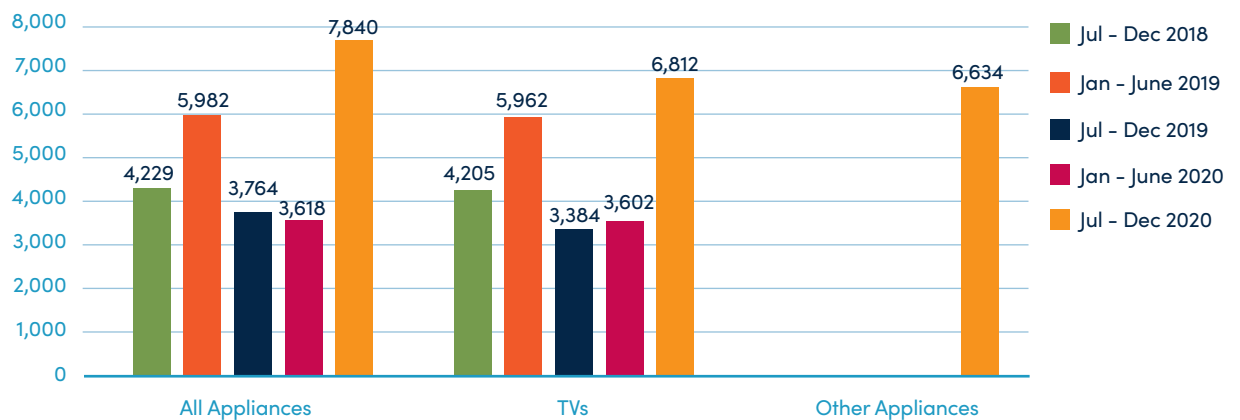
Rwanda Insights

Off-Grid Solar Appliances

Between July and December 2020, the total recorded number of appliance sales in Rwanda was 7,840 units. This is the highest number recorded since reporting began, and around a 110% increase compared the first half of 2020 and the second half of 2019. This number is being

driven by the TV sales, which account for nearly all appliances sold in the country (87%) and were all sold via PAYGo and bundled. Sales of fans, RUs and SWPs do not pass three-data point control, while 6,634 units were sold in the other appliances category.

Figure 28 - Semi-annual Evolution for Appliances Products - Rwanda



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliance types that passed three-data point control any of the rounds are included in the figure.



Tanzania Insights

Background

Tanzania reported its first case of COVID-19 in March, but the public health response measures adopted by the government have differed from other countries in the region. Initially, authorities banned large public gatherings, cancelled international flights, and mandated the wearing of face masks in Dar Es Salaam, but all restrictions were lifted in July 2020.

While the government of Tanzania did not specifically support off-grid solar companies during the COVID-19 pandemic, the Bank of Tanzania did reduce the interest rate on loans to commercial banks from 7% to 5% to allow them to provide loans to their customers - including off-grid solar companies - at a lower rate.

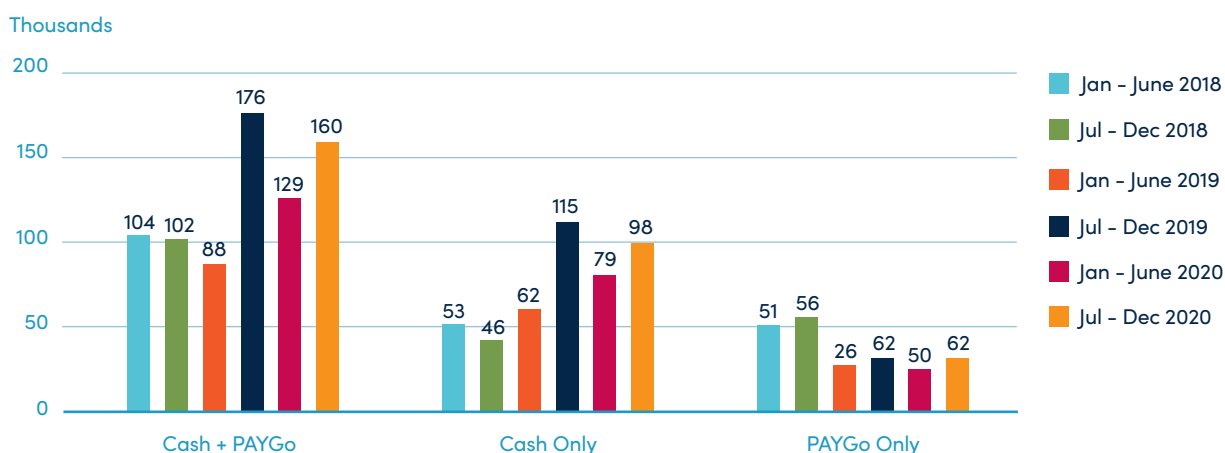
In November 2020, the Green Economy Recovery Fund (GERF) was launched, a US\$ 1.4 million RBF program funded by the Federal Ministry for Economic Cooperation and Development (BMZ) through Energizing Development (EnDev) and implemented by SNV Tanzania.³⁸ The RBF, which builds upon a US\$ 3.5 million RBF that ran since 2013 and closed in August 2020, supports the recovery of pico-PV solar and small solar home system consumer markets throughout Tanzania.

Sales Trends

Off-Grid Solar Lighting

Sales of off-grid solar products in Tanzania totaled 160,000 units between July and December 2020. This is a 24% increase compared to the last reporting round, while it is 9% lower than the first half of 2019. Both cash and PAYGo sales registered an increase this reporting period. Around 98,000 were sold on a cash basis - a 24% increase compared to the first half 2020, but a 14% decrease in comparison to the second half of 2019. PAYGo sales stand at 62,000 units, an increase of 23% compared to the last reporting round, while remaining stable compared to the second half of 2019.

Figure 29 - Semi-annual Evolution of Volume of Lighting Products Sold - Tanzania



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 instalments over time or pays for use of the product as a service.



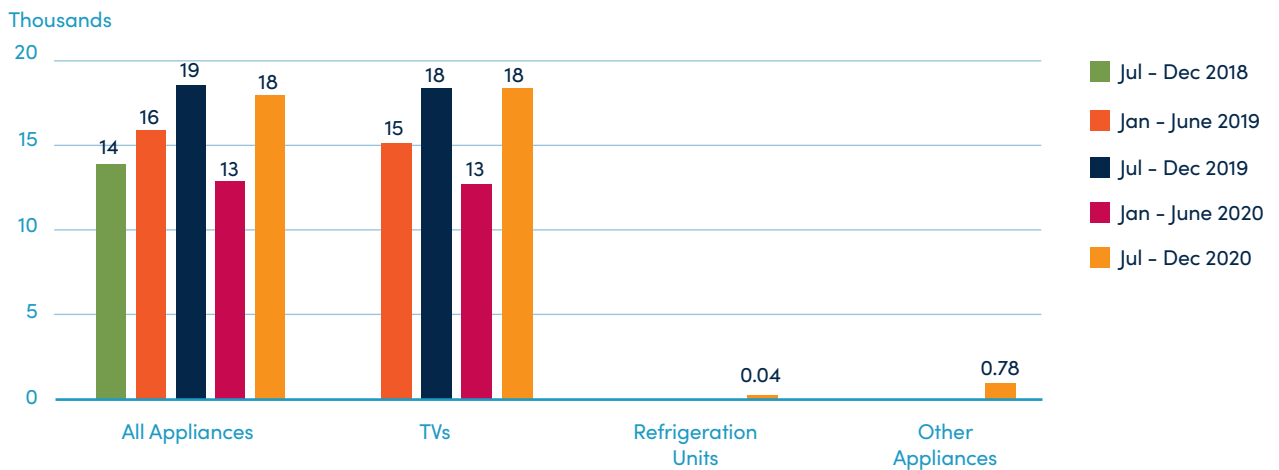
Tanzania Insights

Off-Grid Solar Appliances

Between January and June 2020, the total recorded number of appliance sales in Tanzania was 18,000 units. This is a 40% increase compared to the last round of data collection, and a slight 2% decrease compared to the second half of 2019.

TVs account for nearly all the appliances sold in the country. Sales of RUs were marginal with 38 products sold. Sales for fans and SWPs did not pass three-data point control, while sales for other appliances were just over 780 units.

Figure 30 - Semi-annual Evolution for Appliances Products - Tanzania



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliances types that passed three-data point control any of the rounds are included in the figure.





Uganda Insights

Background

A strict partial lockdown was enforced in Uganda in March 2020. The off-grid solar sector did not initially meet the criteria to be a designated essential service, therefore sales and installation virtually came to a complete halt. **As the lockdown began to ease from late May, companies indicated that sales gradually increased in the second half of the year.** However, Uganda experienced floods due to heavy rainfall and locust infestations, which negatively impacted farmers' incomes.

Uganda has experienced an economic slowdown during the COVID-19 pandemic. While the economy experienced strong growth of 8% in the first half of 2020, it was severely affected by the pandemic in the second half of the year. Economic activity stalled due to the initial lockdown, border closures and the spillover effects of the disruption in global demand for Ugandan exports. As a result, the economy in Uganda contracted for the first time in a decade by about 4.5% in 2020.

In general, local currency debt financing remains low, with poor uptake due to high interest rates and stringent commercial bank requirements. In order to solve these issues, **UNCDF has set up an in-house working capital facility with more appropriate payment terms and lower interest rates.** This facility is coupled with technical

assistance to help the companies become more investment ready.

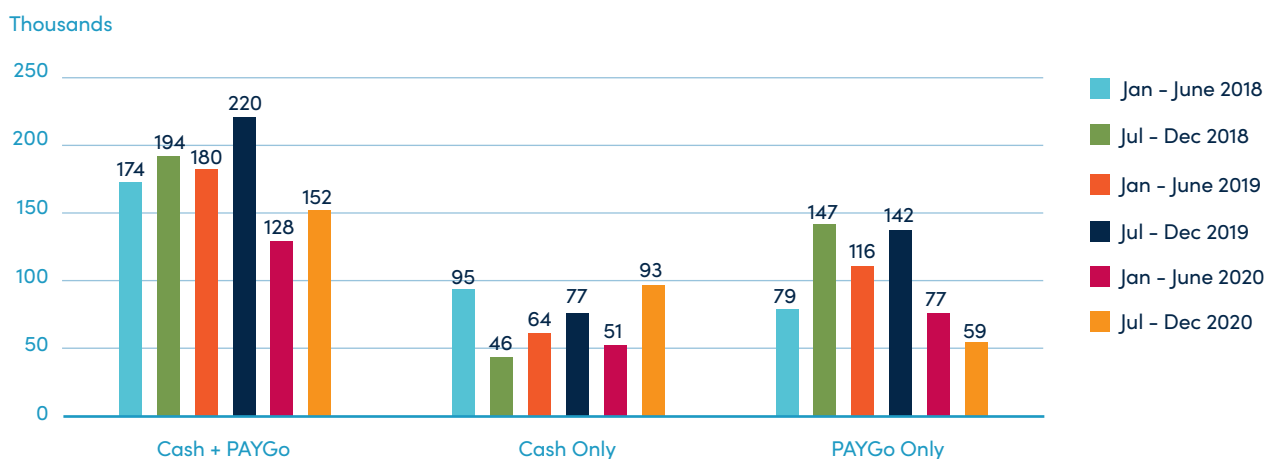
To help off-grid solar and cookstove companies survive the COVID-19 crisis, the Private Sector Foundation Uganda (PSFU), in partnership with EnDev Uganda, started a fund that runs from November 2020 until March 2021. The aim is to temporarily cover the household cost of maintaining their solar PAYGo systems, to temporarily cover companies' operating costs to maintain their activity, and to conduct training for staff.³⁹

Sales Trends

Off-Grid Solar Lighting

Sales of off-grid solar products in Uganda totaled 152,000 units between July and December 2020. This is a 19% increase compared to the last reporting round and a 31% drop from the second half of 2019. **Cash sales registered an increase during this reporting period, while PAYGo sales decreased.** Around 93,000 units were sold on a cash basis – an 83% increase compared to the first half of 2020 and 23% increase in comparison to the same period in 2019. PAYGo sales, at 59,000 units, have decreased by 24% compared to the last reporting round and dropped 59% compared to the first half of 2019.

Figure 31 - Semi-annual Evolution of Volume of Lighting Products Sold - Uganda



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 instalments over time or pays for use of the product as a service.



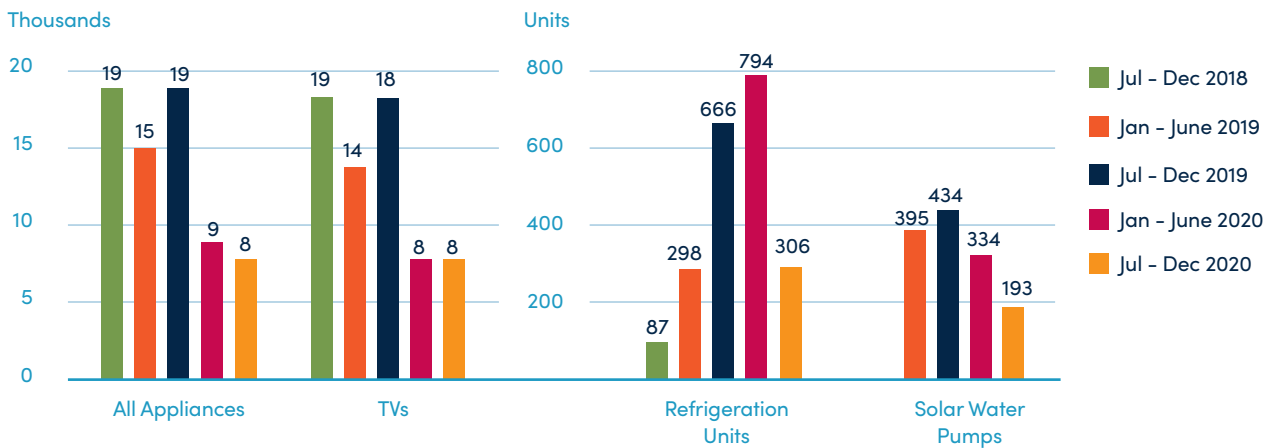
Uganda Insights

Off-Grid Solar Appliances

Between July and December 2020, the total recorded number of appliance sales in Uganda was 8,200 units. This is an 11% decrease compared to the last round of data collection, and 58% less than the second half of 2019. TVs account for 94% of the appliances sold in the country with close to

8,000 units. Affiliates also sold around 300 RUs and 190 SWPs in Uganda. Both product categories saw decreases in volumes compared to the previous rounds. Sales of fans and other appliances do not pass three-data point control.

Figure 32 - Semi-annual Evolution for Appliances Products - Uganda



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliance types that passed three-data point control any of the rounds are included in the figure.





Zambia Insights

Background

Zambia recorded its first COVID-19 case in March. Regional lockdowns were imposed in a number of areas, which initially forced off-grid solar companies to slow down, or close some of their operations. **However, off-grid solar companies were classified as essential service providers in April, allowing them to remain open and operational.**

In the second half of the year, the government has been slowly lifting lockdowns, border closures, and restrictions. Despite these measures, the Zambian economy contracted by 4.2% in 2020, largely due to the COVID-19 pandemic. Currency depreciation remains an issue, as the Zambian Kwacha depreciated by 31.5% between March and September 2020, primarily because of the decline in commodity prices, such as copper, upon which the economy relies.⁴⁰ This will likely increase the cost of off-grid solar products, as most of these products are imported. Some off-grid solar

companies have foreign currency-based loans, and the currency depreciation will affect their loan repayments, ultimately impacting the pricing of products.

Companies were also required to retroactively pay import duties on products that entered the countries in previous years. This created uncertainty and potentially undermined the financial health of affected players in 2020 during an already challenging period.

To financially support companies during COVID-19, the Zambian government created a Targeted Medium-term Refinancing Facility (TMTRF).⁴¹ This facility, with a total budget of US\$ 4.5 million, allows commercial banks and non-financial institutions to access funds from the Bank of Zambia for on-lending to businesses and households. The TMTRF prioritizes four sectors; agriculture, manufacturing, tourism, and energy.



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40 ACE (2021), Off-grid Solar Market Update: Zambia (forthcoming).

41 For more information, please see the [Targeted Medium-term Refinancing Facility report](#).



Zambia Insights

Sales Trends

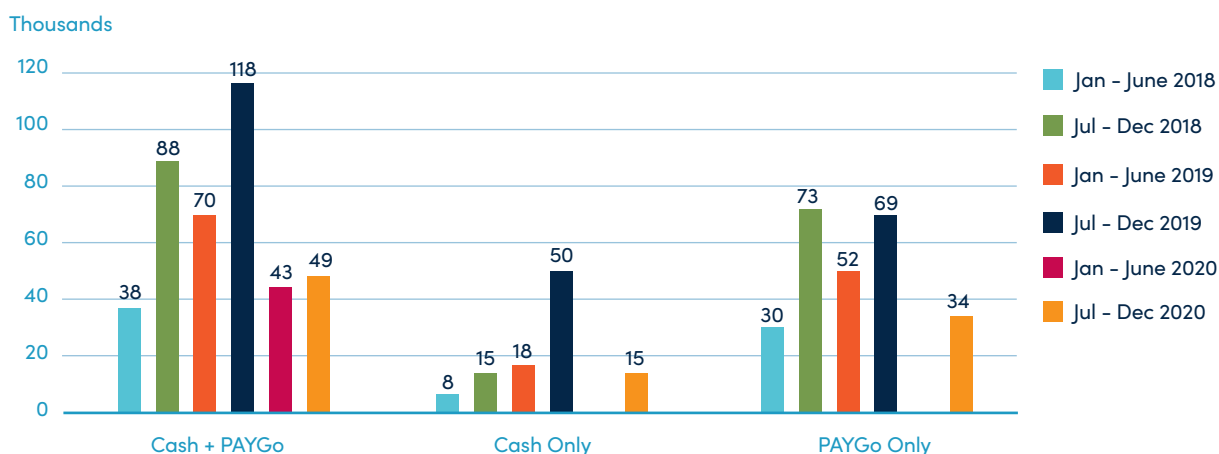
Off-Grid Solar Lighting

Sales of off-grid solar products in Zambia totaled 49,000 units between July and December 2020. This is a 13% increase compared to the last reporting round but still a 59% drop in comparison with the second half of 2019. The split between cash and PAYGo did not pass the three-data point control last round but can be included this time. Cash sales totaled over 15,000 units, a 69% decrease compared to the second half of 2019, whereas PAYGo sales totaled 34,000, a 52% decrease compared to the same period.

Off-Grid Solar Appliances

Between July and December 2020, the total recorded number of appliance sales in Zambia was 3,764 units. This is a 30% decrease compared to the last round of data collection, and a 47% drop compared to the second half of 2019. Again, TVs account for nearly all appliances sold in the country. Sales of refrigeration units, fans and other appliances were negligible and did not pass three-data point control, while there were 0 sales of SWPs recorded.

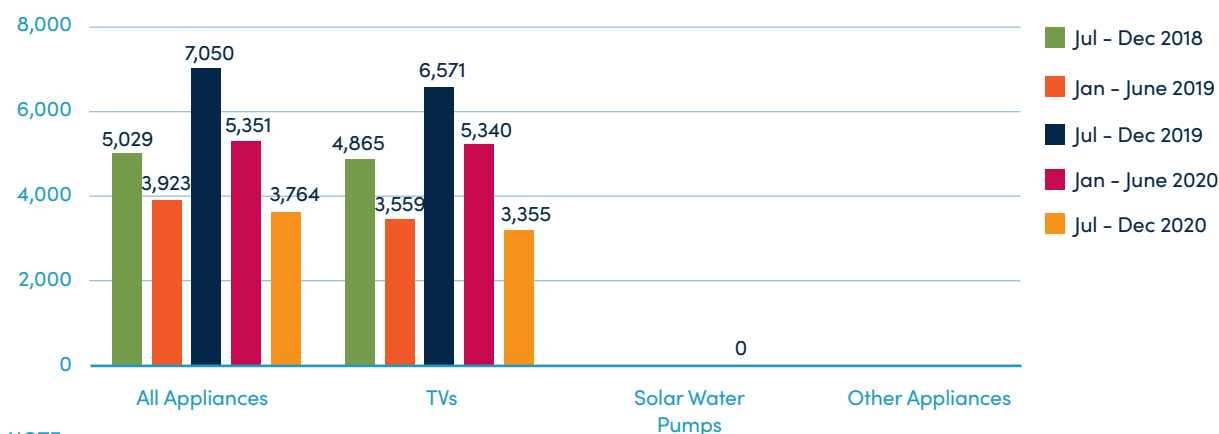
Figure 33 - Semi-annual Evolution of Volume of Lighting Products Sold - Zambia



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 instalments over time or pays for use of the product as a service.

Figure 34 - Semi-annual Evolution for Appliances Products - Zambia



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliances types that passed three-data point control any of the rounds are included in the figure.



Other East African Countries

Sales Trends

Off-Grid Solar Lighting

In **Madagascar**, affiliates recorded 59,000 units sales. This is a 557% growth – the largest relative increase in East Africa compared to the last reporting round. It is also a 91% increase compared to the large volumes reported for Madagascar in the second half of 2019. Companies anecdotally shared that this can partly be explained due to increasing demand for portable lanterns, and the start of the US\$ 40 million Off-Grid Market Development Fund, an RBF that was developed by the Government of Madagascar, the World Bank and Bamboo Capital Partners.

Sales in **Malawi** also increased significantly to 94,000 units in the second half of 2020, 151% more than the volumes in the first half of 2020 and an 81% increase compared to the same period in 2019. Future rounds will reveal if the growth trend continues or if it is connected to bulk procurements.

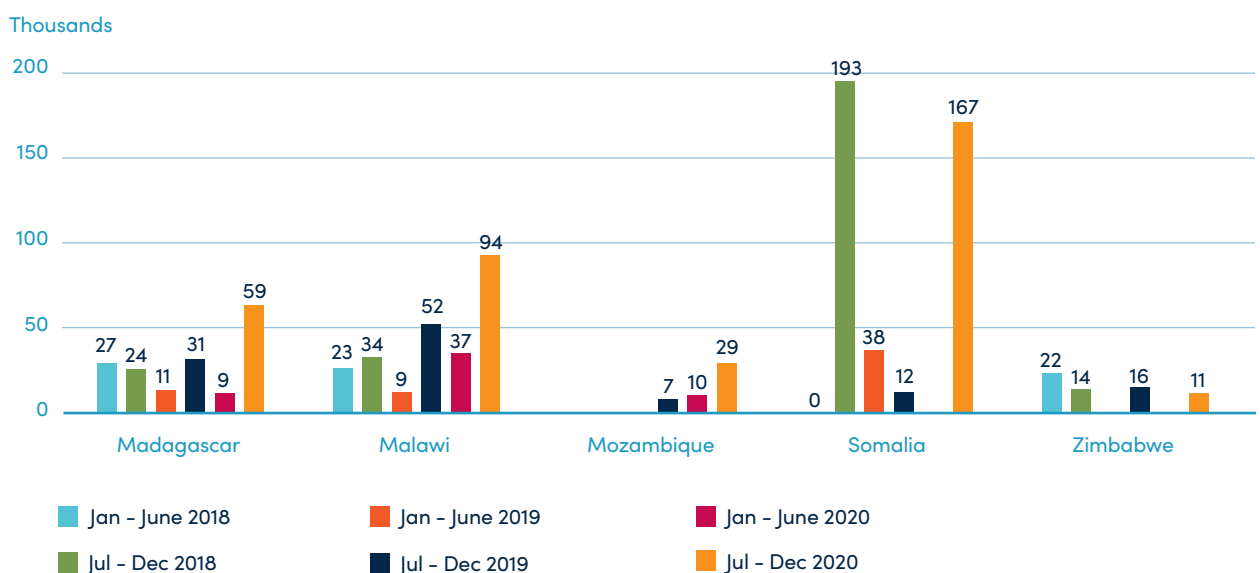
Mozambique is the third country with higher sales; 184% compared to last round reaching 29,000 units sold. This is a 342% increase compared to the second half of 2019. Sales in the second half of the year were positively impacted by supporting programs such as the BRILHO program and EnDev COVID-PAY.⁴²

In **Somalia**, affiliates reported 167,000 units sold. Last round there were not sufficient volumes reported for Somalia to be included, but this is a 1341% increase compared to the second half of 2019. This large increase is likely due to bulk procurement sales.

Zimbabwe could not be included in the previous reporting round, but this round affiliates reported around 11,000 sales. This is still a 33% decrease compared to the second half of 2019.

Burundi, Mauritius and South Sudan did not see enough companies reporting to show volumes this reporting round.

Figure 35 - Semi-annual Evolution of Volume of Lighting Products Sold - Other East African Countries



42. For more information, please see [BRILHO](#) and [EnDev COVID-PAY](#).



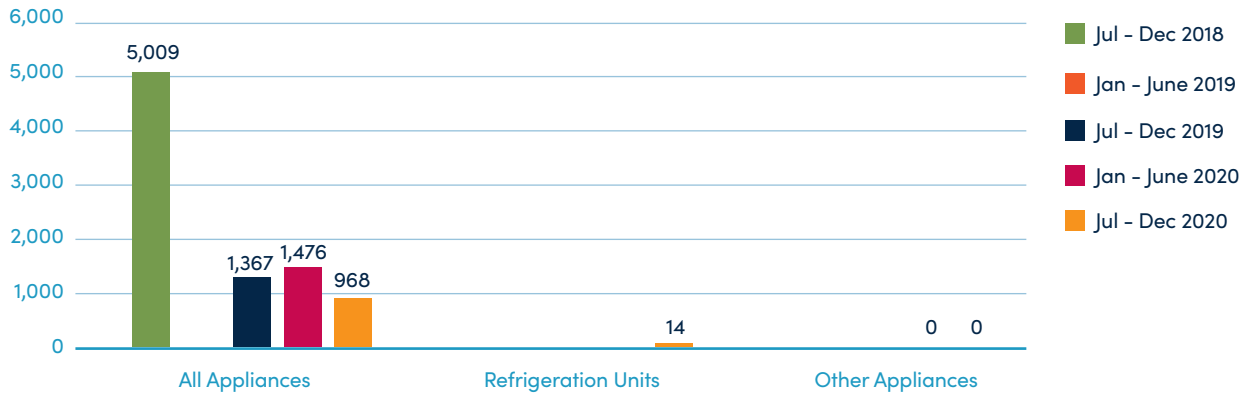
Other East African Countries

Off-Grid Solar Appliances

Mozambique is the only additional country to show sales of appliances in East Africa, with 968 units sold. A small number of RUs, 14, were sold in the first half of 2020. Sales of TVs, fans and

SWPs cannot be shown due to a low number of companies reporting and confidentiality rules, while there were 0 sales of other appliances recorded.

Figure 36 - Semi-annual Evolution of Volume of Appliances Sold - Other East African Countries



NOTE:

The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units.





**West
Africa
Insights**



West Africa Insights



Sales Trends

Off-Grid Solar Lighting Products

Sales of off-grid solar products in West Africa totaled 434,000 units sold between July - December 2020. This is a 23% increase compared to the first half of 2020 and a 19% increase compared to the same period in 2019.

Cash sales increased in West Africa to around 193,000 units, with a value of US\$ 4.73 million. This is an increase in sales volumes of 11% compared to both the first half of 2020 and the second half of 2019. In contrast, 242,000 units were sold via PAYGo, with a value of US\$ 62.32 million. This is a 34% increase in volumes compared to the first half of 2020, and a 26% increase compared to the second half of 2019.



Portable Lanterns

Portable lantern sales totaled 182,000 units in West Africa, 42% of the region's sales. Affiliates reported sales of 104,000 units of portable lanterns without mobile charging - i.e. those with an indicative wattage of 0-1.499 Wp. This is a 25% decrease compared to the first half of 2019 and a 20% increase to the second half of 2019. Conversely, portable lanterns capable of charging mobile phones - i.e. with an indicative wattage of 1.5-2.999 Wp - experienced an increase of 36% with sales of 78,000 units compared to the first half of 2020 and a 21% decrease compared to the second half of 2019.



Multi-light systems

For the first time, West Africa recorded over 100,000 units of multi-light systems sold between July and December 2020, representing 24% of the regional sales. This is a significant increase of 85% compared to the second first half of 2020 and an 44% increase in comparison with the volumes recorded in the second half of 2019. Companies anecdotally shared that they were able to expand in the region, sometimes supported by donor programs, and that power cuts during lockdowns stimulated demand for both multi-light systems and SHS.



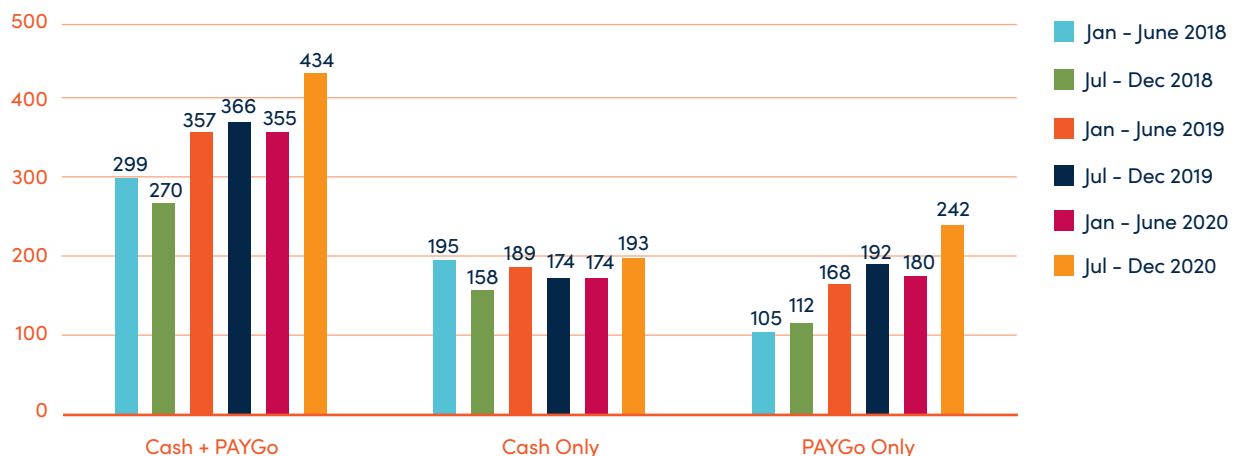
Solar Home Systems (SHS)

A new record of 148,000 SHS were sold in West Africa in the second half of 2020. This is a 45% increase compared to the first half of 2020 and a 36% increase compared to the second half of 2019. Sales were higher across all categories.

The 50-100 Wp remains the bestseller in the region with around 85,000 units, seeing a 37% increase compared to last reporting round and 54% increase compared to the second half of 2019. It is the first time that the second half of the year reported greater sales volumes than the first since recording began.

Figure 37 - Semi-annual Evolution of Volume of Lighting Products Sold - West Africa

Thousands



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 instalments over time or pays for use of the product as a service.

West Africa Insights

The 21-49 Wp category recorded 27,000 units sold. Sales volumes increased by 32% compared to the first half of 2020 and are close to the level we saw in 2019.

SHS with wattage between 11-20 Wp sold 26,000 units in the first half of 2020, a 74% increase in comparison with the last reporting round, and a 34% increase compared to the second half of the previous year.

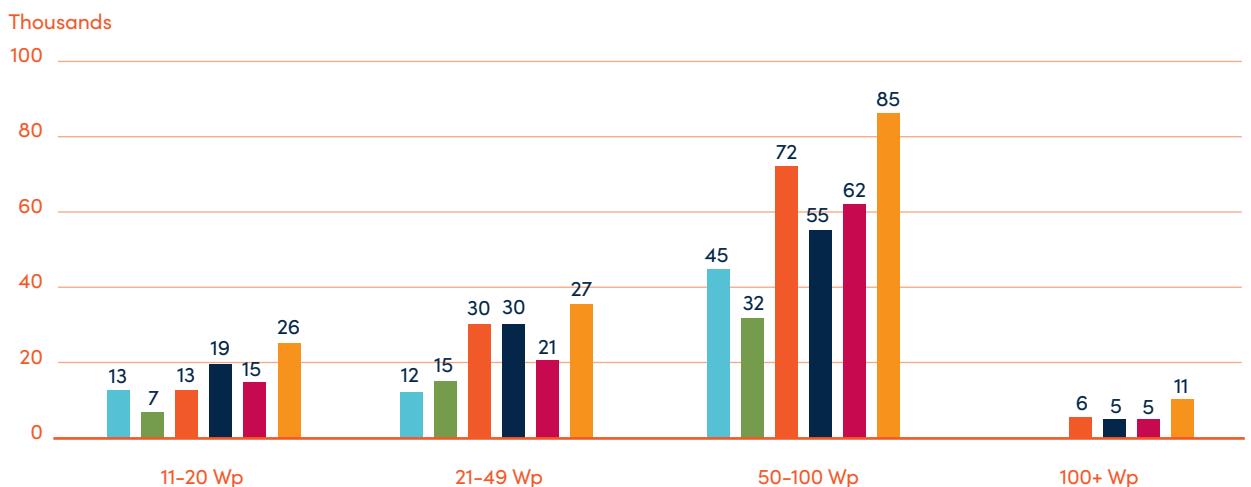
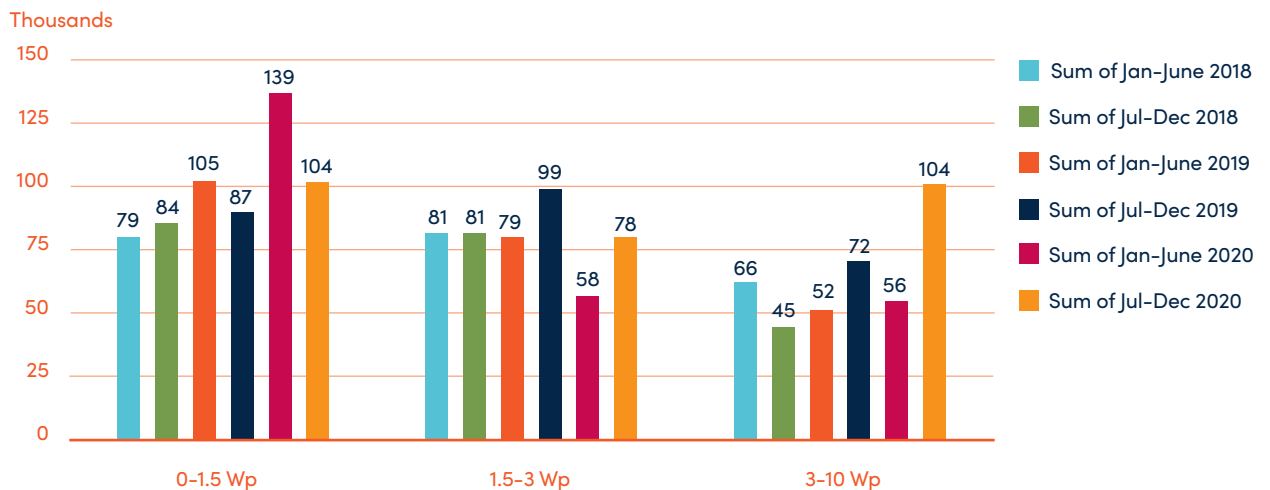
Sales of the 100+ Wp saw the largest relative increase with 118% compared to the first half of 2020 and second half of 2019, to around 11,000 units. West Africa is the only region to report a considerable increase in this product category.

Off-Grid Solar Appliances

Between July and December 2020, the total recorded number of appliance sales in West Africa reached 84,000 units sold. This is a 65% increase compared to the first half of 2020, but an 11% drop compared to the second half of 2019.

Appliance sales in West Africa represent 22% of total appliance sales in sub-Saharan Africa (SSA). Fans sold in West Africa account for 80% of the total fan sales in SSA with 30,000 units. Solar water pumps (SWPs) and refrigerator units (RUs) represent 43% and 33% of total SSA sales, with 3,140 and 998 units sold. TVs recorded over 50,000 units sold, but because sales in East Africa are considerably higher, this only represents 22% of total TV sales in SSA.

Figure 38 - Semi-annual Evolution of Global Sales Volumes by Product Category - West Africa

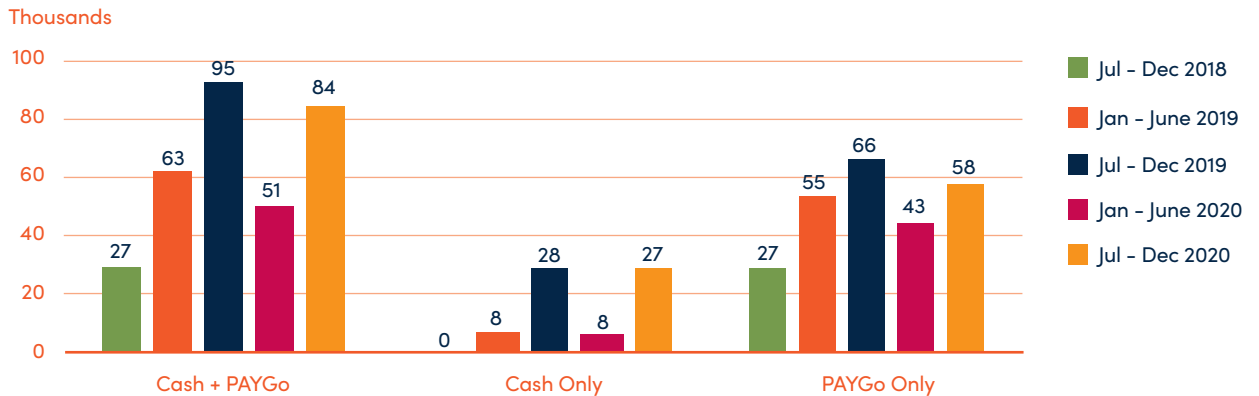


NOTE:

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.

West Africa Insights

Figure 39 - Semi-annual Evolution for All Appliances - West Africa



NOTE:

- The category 'All 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 instalments over time or pays for use of the product as a service.



Fans

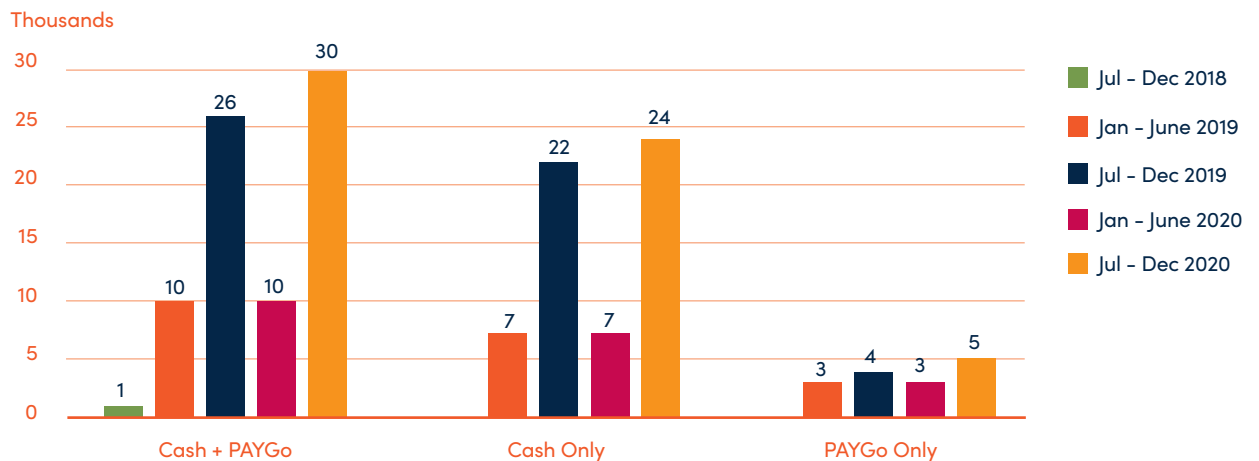
West Africa remains the second largest market for fans globally with 30,000 units after South Asia. Unlike the Asian region however, sales in West Africa increased sharply by 194% compared to the first half of 2020, an increase of 14% compared to the second half of 2019. Sales follow a seasonal pattern in the region, with higher sales in the second half of the year, as the climate is hot and humid from around June to October.

Cash sales dominate the market, with 24,000 units sold compared to 5,000 units sold via PAYGo. This is due to the lower cost of the appliance compared to others, and anecdotally due to bulk procurements.

Another key difference compared to South Asia is that a much greater proportion (51%) of the fans sold in West Africa are reported to be sold bundled with a power system. In South Asia this is only 2%.

For the portfolio of product categories sold, Figure 41 shows that in West Africa, table fans are the most popular category, with over 19,000 units sold. The totality of these table fans fell in the large category, meaning with a diameter larger than 12". Whereas, in the last round, this product was overwhelmingly sold bundled with a SHS (98%), this time it is 52%. These percentages will be monitored over time to observe whether fans are sold bundled with large SHS or not.

Figure 40 - Semi-annual Evolution for Fans - 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 instalments over time or pays for use of the product as a service.

West Africa Insights

Pedestal fans recorded over 10,000 units sold in the second half of 2020. Approximately 47% of these pedestal fans are sold bundled with SHS. This was 80% in the first half of 2020.

No sales of ceiling fans were reported for the fourth round in a row. Ceiling fans seem to generally be highest in regions with significant amounts of component based solar system sales, which is predominantly in Asia and negligible in sub-Saharan Africa.

Both table and pedestal fans recorded increases compared to the first half of 2020, with different magnitudes. Pedestal fans experienced the largest increase of 257% compared to the first half of 2020. This is still a 17% reduction compared to the second half of 2019. Sales of table fans increased 169% compared to the last reporting period and saw a

42% increase compared to the second half of the previous year.



TVs

In West Africa, over 50,000 TVs were sold by affiliates in the second half of 2020. This remains the second largest regional market for this appliance type after East Africa. Sales showed a 27% increase compared to the first half of 2020, but a 25% drop compared to the second half of 2019.

TVs are usually sold via PAYGo in the region, which is largely due to the bundling with SHS; 77% of products reported were sold with a power system. It is not possible to show the split between cash and PAYGo this round due confidentiality rules.

Figure 41 - Semi-annual Evolution of Fans by Product Category - West Africa

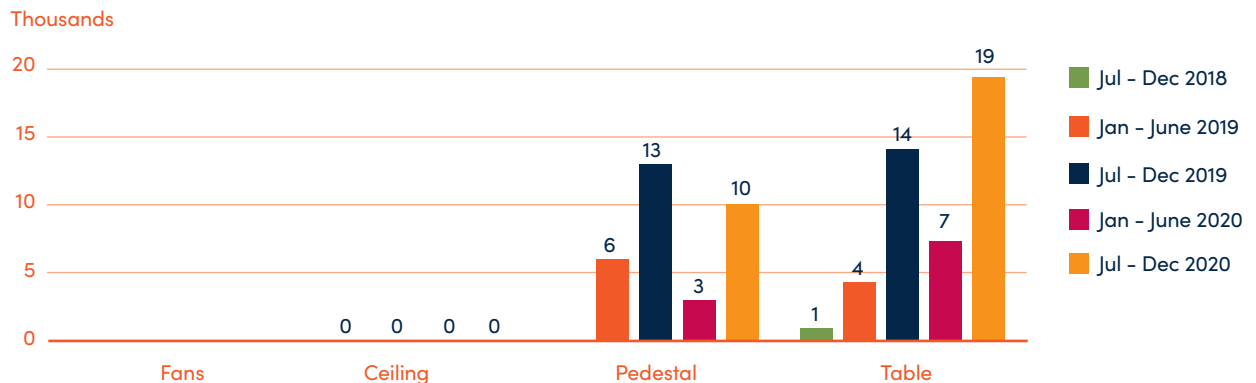
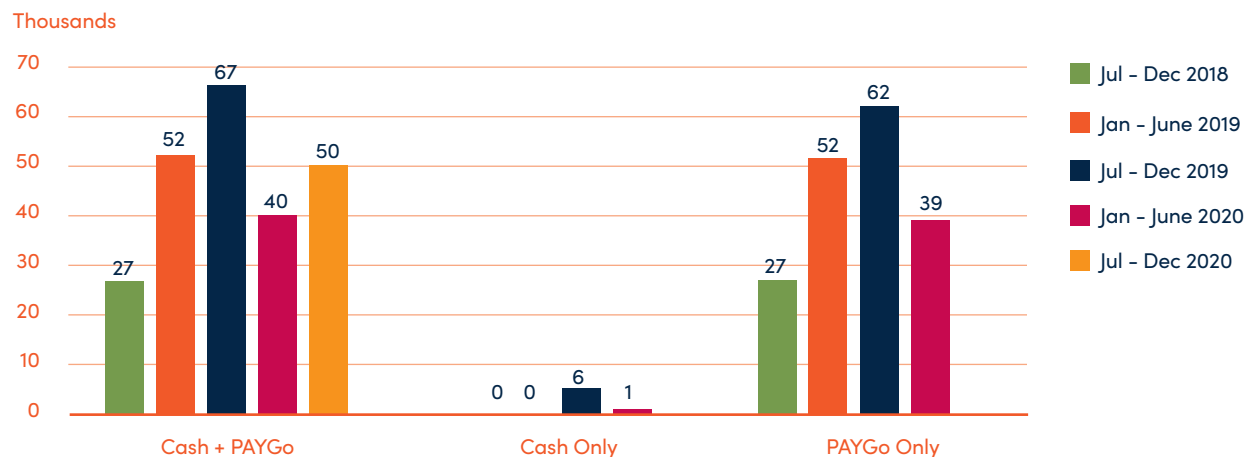


Figure 42 - Semi-annual Evolution for TVs - West Africa



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 instalments over time or pays for use of the product as a service.

West Africa Insights

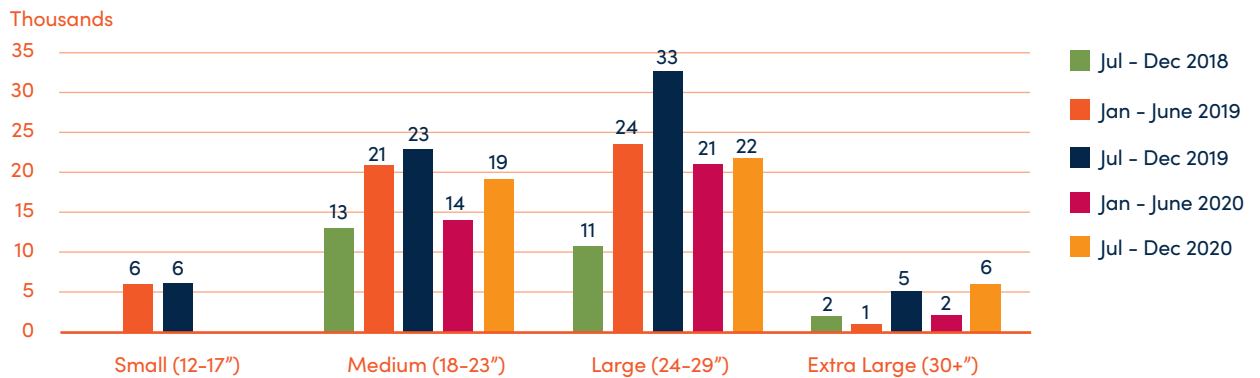
In terms of diversity of product categories, the largest share of TVs sold in West Africa are large (of display size between 24" and 29") with 22,000 units sold. Medium TVs follow closely with 19,000 units. While sales of extra-large TVs remain the smaller category with 6,000 products sold in this reporting period, it is the highest number ever recorded. As mentioned previously, this can partly be explained by decreasing prices,⁴³ customers purchasing SHS bundled with extra-large TVs during lockdown periods, and the limited difference in power consumption between large and extra-large TVs. Sales of small TVs do not pass

three-data point control, meaning that only a few affiliates are active in that segment in West Africa.

All segments in West Africa recorded increases but again, at varying margins. Extra-large TVs had the largest relative increase with a 190% rise compared to the first half of 2020, against the 33% increase of the medium TVs and only 1% of large TVs compared to the same reporting period.

Most TVs, of all sizes, were sold as part of a bundle. Affiliates reported that 76% of both medium and large TVs, and 70% of the extra-large TVs were sold bundled.

Figure 43 - Semi-annual Evolution of TVs by Product Category - 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 instalments over time or pays for use of the product as a service.



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West Africa Insights



Refrigeration Units (RUs)

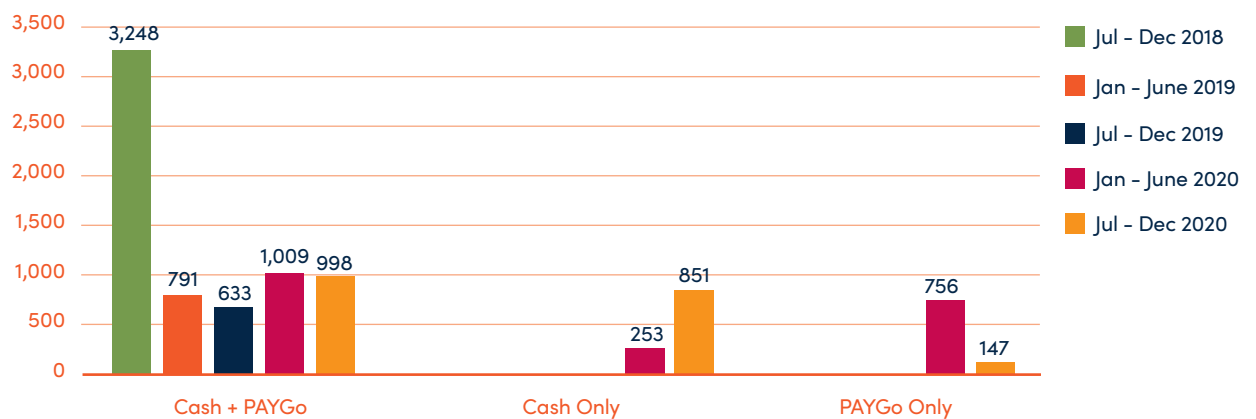
As seen in East Africa, RUs are the only appliance type that experienced a decrease this round, although this drop is significantly smaller in West Africa. Between July and December 2020, almost 1,000 units were sold, a 1% decrease compared to the last reporting period.

In West Africa, 15% of RUs sold via PAYGo this round with 147 units, while cash sales increased considerably compared to last round with 851 units. It is only the second time the split between the two payment methods can be shown, indicating that the number of companies involved in the market, and the data collection, is increasing.

81% of RUs are reported to be sold bundled with a power system, while the remainder are sold without one. These percentages will be monitored over time to observe whether RUs are increasingly sold bundled with large SHS or not, and via cash or PAYGo.

In terms of product category diversity, affiliates sold 284 refrigerators, representing 25% of the sales in West Africa. The remaining 75% comprises freezers, multi-temperature refrigerators and refrigerator-freezer combination units, but no split can be offered as there are not enough companies reporting to pass the confidentiality rule.

Figure 44 - Semi-annual Evolution for RUs - 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 instalments over time or pays for use of the product as a service.

West Africa Insights



Solar Water Pumps (SWPs)

SWPs experienced the largest relative increase amongst all appliance types in West Africa, with a 1815% increase of sales volumes, and 3,140 units sold. Even compared to the second half of 2019 this is a significant increase of 375%. It is by far the highest number ever recorded, primarily because established SWP companies are expanding in the region.

In West Africa, nearly all SWPs are sold bundled (98%) with a power system. Unfortunately, not enough companies reported to show the split between cash and PAYGo this round.

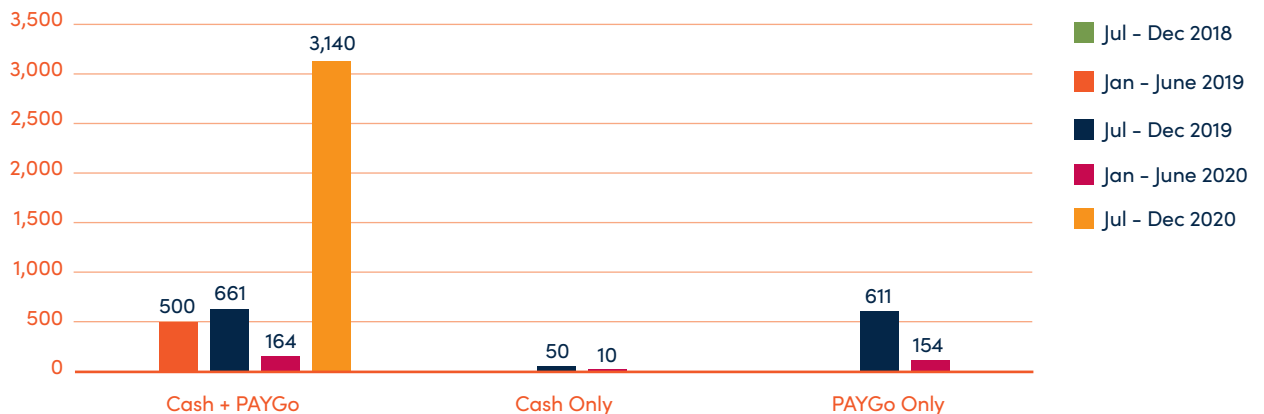
Other Appliances

Sales are also recorded for a wide variety of other solar-powered appliances, which amounted to around 1,400 units in West Africa, all sold via PAYGo.

These units are not reflected in 'All Appliances' and include products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Currently, if separated, these volumes would not pass our confidentiality rules. For the time being, they will be reported together. The progress of each appliance type will be monitored.

Radios are excluded from both 'All Appliances' and 'Other Appliances', as they are regularly sold bundled with lighting systems and their large volumes would bias the overall results. **More than 39,000 radios were sold in West Africa in the second half of 2020.**

Figure 45 - Semi-annual Evolution for SWPs - 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 instalments over time or pays for use of the product as a service.

West Africa Insights



Burkina Faso Insights

Background

In the beginning of the COVID-19 outbreak in March 2020, the government adopted several containment measures. The authorities began to ease social and economic restrictions in late April, slowly opening back schools and airports. However, after the elections in November, there has been a second more aggressive wave of infections.

Burkina Faso was already facing a complex humanitarian and security crisis for multiple years before the COVID-19 pandemic due to insurgencies of armed groups and the displacement of over one million civilians. Due to COVID-19, the demand for health services grew in 2020, but attacks have decreased the number of functioning health facilities. In September 2020, 95 health facilities were closed, representing 8,5% of the infrastructure.

The challenging environment makes it difficult for off-grid solar companies to attract funds (notably equity). Despite this, sales have been increasing in 2020, supported by the government and funding from UNCDF and other international finance organizations.

The government of Burkina Faso introduced a 50% reduction in the cost of solar kits for vulnerable households to curb the negative impact of the pandemic.⁴⁴ In addition, UNCDF started the Fond des Energies Renouvelables pour la Résilience du Burkina Faso (FERR-BF) in April to support solar companies. It provides US\$ 50,000 to US\$ 200,000 to companies that submit winning project bids. Preference is given to companies offering consumer finance or proposing PAYGo systems and other innovative digital payment platforms. This might have had a positive effect on (PAYGo) sales.



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44 For more information, please see [Presidency of Faso, State of the Nations Address 2020](#).

West Africa Insights



Burkina Faso Insights

Sales Trends

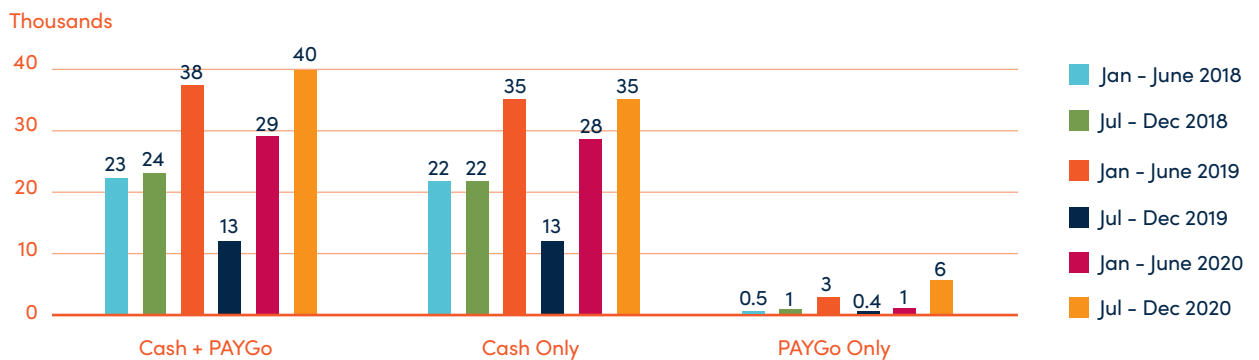
Off-Grid Solar Lighting

Sales of off-grid solar products in Burkina Faso reached over 40,000 units between July - December 2020. This is 40% more compared to the last reporting round. Recorded sales were higher still with increases of 203% compared to the second half of 2019.

Off-Grid Solar Appliances

Between July and December 2020, the total recorded number of appliance sales in Burkina Faso was 1,259 units. This is a 43% increase compared to the last data collection round, but 84% less than the second half of 2019. TVs account for 76% of all appliances sold in the country with 956 units. Sales of RUs, fans, SWPs and other appliances were small and did not pass the three-data point control.

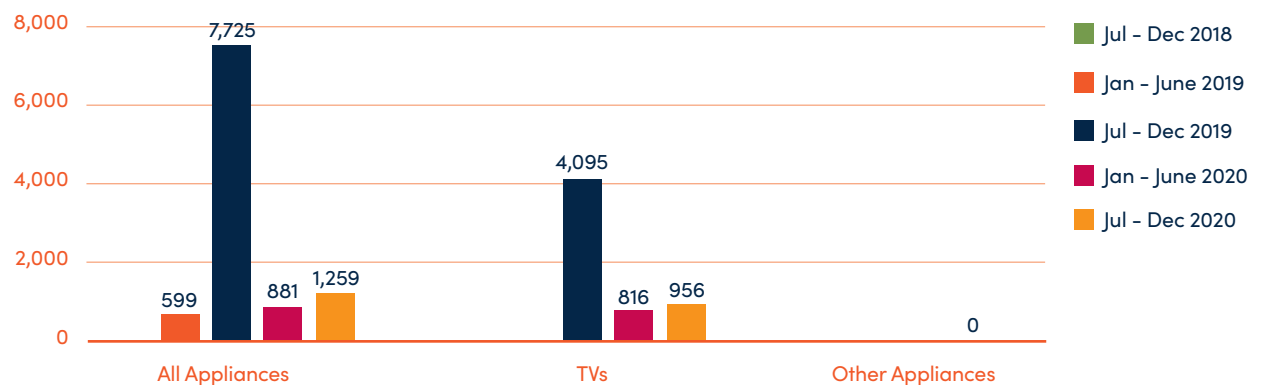
Figure 46 - Semi-annual Evolution of Volume of Lighting Products Sold - Burkina Faso



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 instalments over time or pays for use of the product as a service.

Figure 47 - Semi-annual Evolution for Appliances Products - Burkina Faso



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliances types that passed three-data point control any of the rounds are included in the figure.

West Africa Insights



Cote d'Ivoire Insights

Background

At the start of the COVID-19 pandemic in March, authorities swiftly adopted containment measures. In May, a relaxation of the containment measures was announced. While the isolation of Grand Abidjan ended on July 15, the state of emergency remained in place.

Beyond COVID-19, the political situation in Cote d'Ivoire remains uncertain following the sudden death of the Prime Minister on July 8th. In October 2020, the country held new elections. The tension surrounding the election led to pre- and post-election conflicts that resulted in a general decline in economic activities over the last four months of the year. Prior to the COVID-19 pandemic, it was projected that the economy would grow by 7%, but this was adjusted to 1.8%.⁴⁵

This economic and political uncertainty may affect future sales in the country, although there are several support mechanisms in place. **The government of Cote d'Ivoire launched a COVID-19 support fund to support small and medium enterprises.** Through this fund, companies with a turnover of less than US\$ 50,000 can benefit from a maximum subsidy of US\$ 1,000. Those with a turnover between US\$ 50,000 and US\$ 250,000 can benefit from an interest-free loan. Whilst companies with a turnover between US\$ 250,000 and US\$ 1.5 million will receive financing with an interest rate of 2.5%.

In addition, the International Finance Corporation (IFC) granted a one-year loan of US\$ 29 million to NSIA Banque Côte d'Ivoire, which will enable NSIA to extend new credit to finance working capital needs of companies struggling due to the COVID-19 pandemic, including off-grid solar companies.



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West Africa Insights



Cote d'Ivoire Insights

Sales Trends

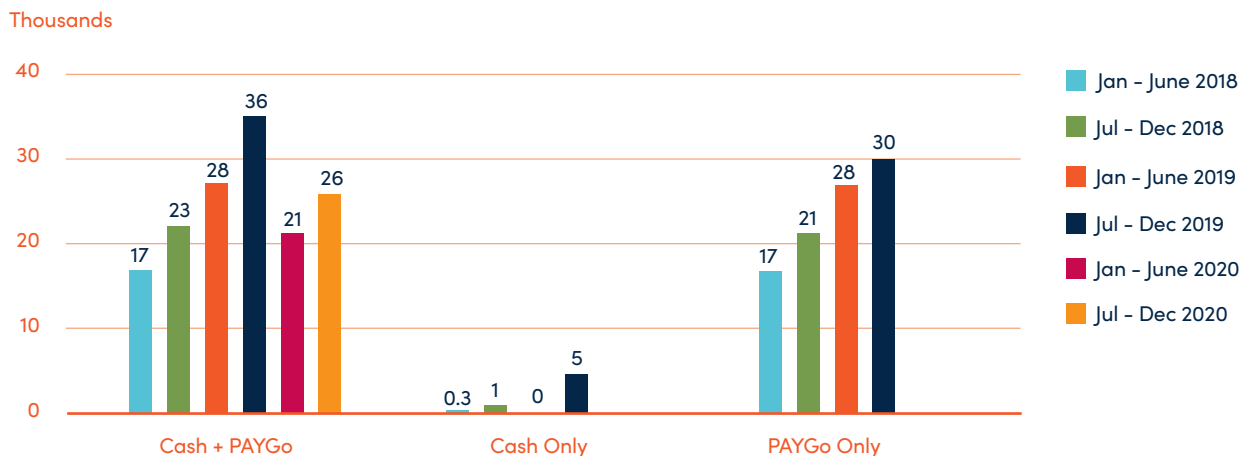
Off-Grid Solar Lighting

Sales of off-grid solar products in Cote d'Ivoire totaled 26,000 units between July and December 2020. This is a 23% increase compared to the last reporting round, when the round-on-round growth observed in the country was halted. Sales volumes are 26% lower in comparison with the second half of 2019. It is not possible to show the split between cash and PAYGo due to the three-data point rule.

Off-Grid Solar Appliances

Between July and December 2020, the total number of appliance sales in Cote d'Ivoire was close to 13,000 units. This is an increase of 44% compared to the first half of 2020 and a 52% decrease compared to the second half of 2019. TVs account for 88% of the appliances sold in the country with around 11,000 units. Affiliates also reported over 1,000 fans sold in the reporting period. Sales of RUs, solar water pumps and other appliances were negligible and did not pass three-data point control.

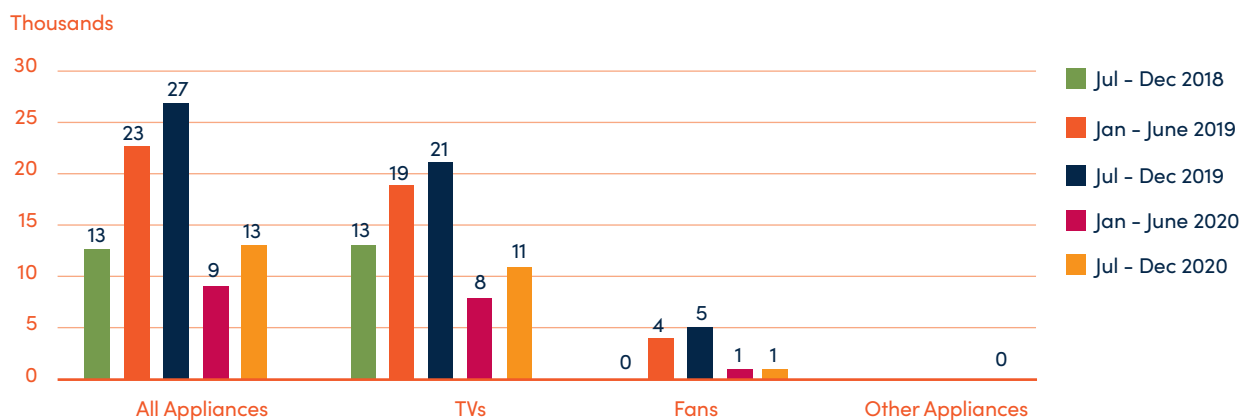
Figure 48 - Semi-annual Evolution of Volume of Lighting Products Sold - Cote d'Ivoire



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 instalments over time or pays for use of the product as a service.

Figure 49 - Semi-annual Evolution for Appliances Products - Cote d'Ivoire



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliance types that passed three-data point control any of the rounds are included in the figure.

West Africa Insights



Ghana Insights

Background

In the beginning of the COVID-19 pandemic, the government adopted sweeping social distancing measures and movement restrictions. The process of easing restrictions began in June, with international flights resuming in September.

While Ghana was consistently part of Africa's ten fastest-growing economies since 2017, the COVID-19 crisis and falling oil prices plunged the country into economic recession in 2020. It is estimated that GDP growth decreased from 6.5% in 2019 to 0.9% in 2020. However, economic growth is expected to accelerate again in 2021, depending on post-pandemic economic recovery.⁴⁶

Lockdown measures and related restrictions have delayed imports of goods and services and reduced sales for some off-grid solar companies. While the pandemic increased demand for electricity access, some companies were not able to meet customer needs due to the disruptions.⁴⁷

The pandemic severely impacted household incomes and employment opportunities, which likely impacted sales. A survey by the Ghana Statistical Service, in collaboration with the World Bank, showed that 77.4% of households in Ghana

experienced a decrease in income due to the restrictions and more than half had to reduce food consumption.⁴⁸

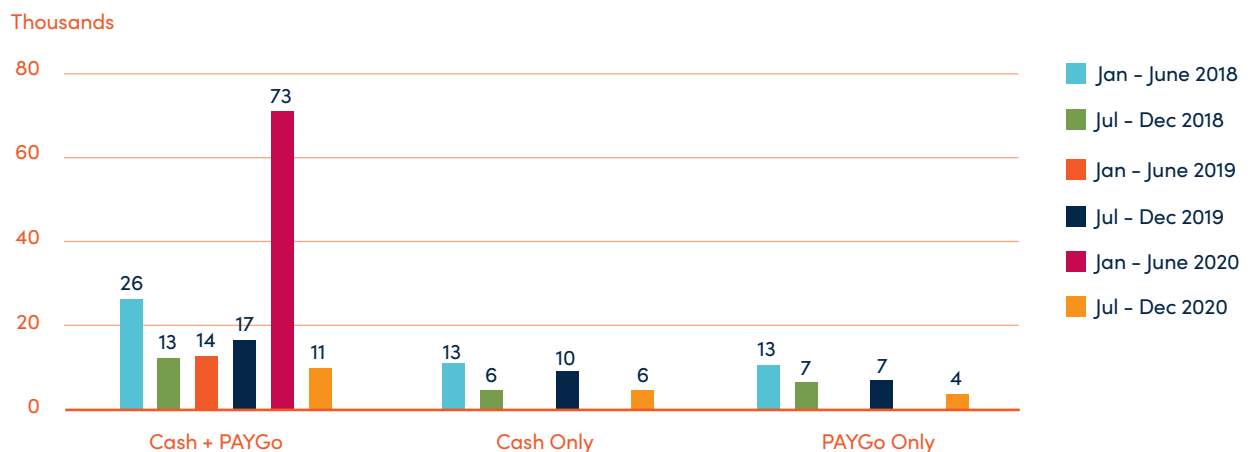
As a response, several support programs were launched, such as the **COVID-19 Recovery and Resilience Program by The National Board for Small Scale Industries (NBSSI) and Mastercard Foundation.** This program provides financial assistance, in the form of grants and soft loans to small and medium enterprises, including off-grid solar companies.⁴⁹

Sales Trends

Off-Grid Solar Lighting

Sales of off-grid solar products in Ghana totaled around 11,000 units between July and December 2020, which is 86% lower compared to the first half of 2020. Between January and June 2020, we saw the largest sales volumes ever recorded. This partly explains the sizable drop. Companies shared that the spike in the first half of 2020 was connected to a new program due to come online towards the second half of 2020. However, the current volumes are still 39% lower compared to the second half of 2019, and they are in fact the lowest volumes observed in the country since reporting started.

Figure 50 - Semi-annual Evolution of Volume of Lighting Products Sold - Ghana



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 instalments over time or pays for use of the product as a service.

⁴⁶ IMF (2021), Policy Responses to COVID-19.

⁴⁷ ACE (2021), Off-grid Solar Market Update: Cote d'Ivoire (forthcoming).

⁴⁸ World Bank (2020), COVID-19 Survey.

⁴⁹ For more information, please see the [COVID-19 Recovery and Resilience Program](#).

West Africa Insights



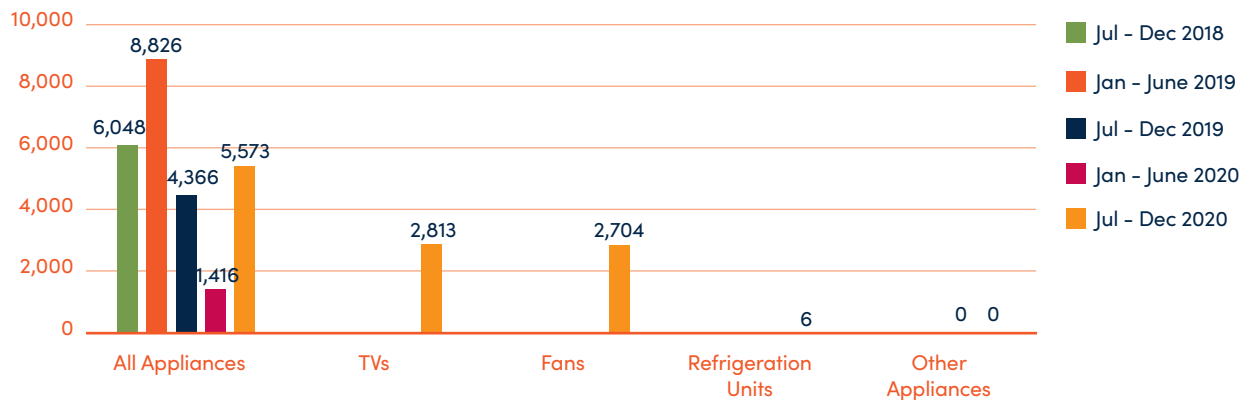
Ghana Insights

Off-Grid Solar Appliances

Between July and December 2020, the total recorded number of appliance sales in Ghana was 5,573 units. This is a 294% increase compared to the first half of 2020 and 28% more than the second half of 2019. This shows that while the sales of lighting products significantly decreased this round, this is not the case for appliances sales. Most appliances (85%) are sold without a power system, which partly explains why appliances sales

in Ghana follow a different trend. TVs represent half of the total appliances sales with 2,813 units, while the other half almost completely consists of fans, with 2,704 units. RUs sales are marginal with 6 units sold. The sales volumes for SWPs cannot be shown as there are not enough companies reporting, while no sales have been recorded for other appliances.

Figure 51 - Semi-annual Evolution for Appliances Products - Ghana



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliance types that passed three-data point control any of the rounds are included in the figure.

West Africa Insights



Nigeria Insights

Background

Nigeria has been severely hit by the spread of COVID-19, and the associated sharp decline in oil prices. Due to COVID-19, the Nigerian economy experienced its deepest recession since the 1980s and contracted by 4%.⁵⁰ The drop in oil prices has exacerbated the currency exchange risk, which remains high. This may discourage foreign investors and poses a significant challenge to off-grid solar companies sourcing foreign currency to import products and carry out business operations.

The government announced VAT exemptions for solar technologies as part of the Emergency Economic Stimulus Bill 2020 in March. **This exemption did not yet have a strong impact on sales in the previous round but may have positively impacted sales in the second half of the year.**

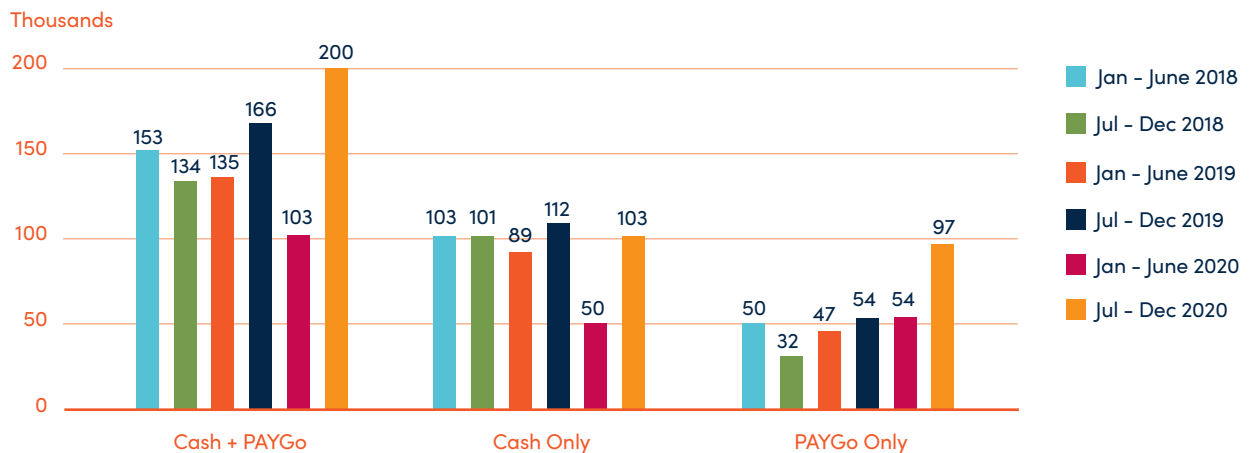
Several support programs were launched in Nigeria in the second half of the year. The Central Bank of Nigeria provided a stimulus package of US\$ 130 million to help business and households to cope with the pandemic. The government also included a COVID-19 component to the Nigeria Electrification Project (NEP), supporting the electrification of healthcare centers using off-grid solar, and the Nigerian off-grid energy investing company All-On launched a US\$ 500,000 relief fund for renewable energy companies.

Sales Trends

Off-Grid Solar Lighting

Sales of off-grid solar products in Nigeria totaled **200,000 units between July and December 2020**. This is a significant 94% increase compared to the first half of 2020, and a 21% increase compared to the second half of 2019. Both cash and PAYGo sales increased. The growth in PAYGo sales is significant, and similar to last round there is roughly a 50/50 split in terms of sales volumes for each category.

Figure 52 - Semi-annual Evolution of Volume of Lighting Products Sold - Nigeria



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 instalments over time or pays for use of the product as a service

West Africa Insights



Nigeria Insights

Off-Grid Solar Appliances

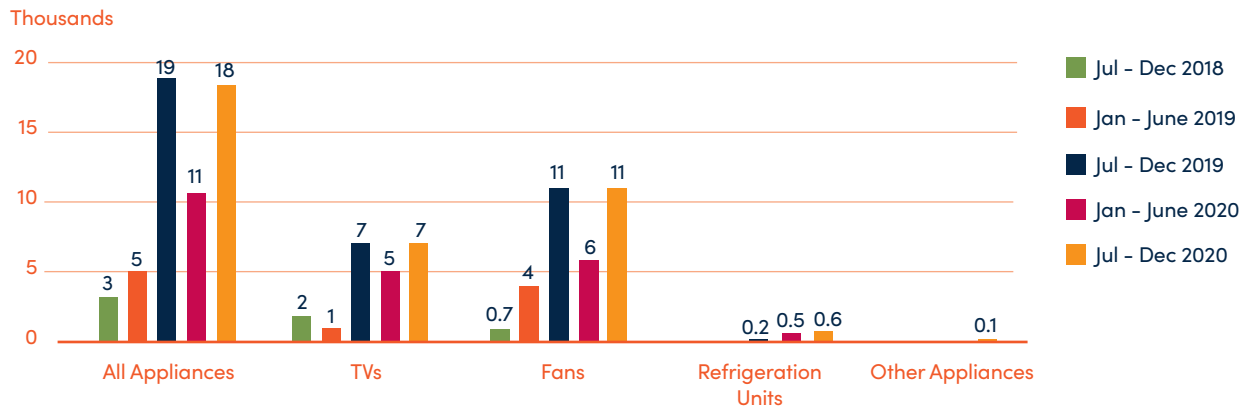
Between July and December 2020, the total recorded number of appliance sales in Nigeria was 18,000 units. This is a 55% increase compared to the first half of 2020, but a 3% decrease compared to the second half of 2019.

Nigeria is, along with India, one of the largest markets for fans, and sees the highest sales number for fans of all countries with close to 11,000 units sold. The majority, around 82%, sold via cash

and bundled with a power system. TVs follow with around 7,000 products sold. Both segments saw increases, with a sharper increase for fans.

Sales of RUs increased 15% compared to the last reporting round, reaching over 600 units sold. Sales of SWPs do not pass three-data point control, while 106 units were sold in the other appliances category.

Figure 53 - Semi-annual Evolution for Appliances Products - Nigeria



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliance types that passed three-data point control any of the rounds are included in the figure.

West Africa Insights



Senegal Insights

Background

The Senegalese government declared a national state of emergency in March and adopted strict containment measures. The measures initially succeeded in containing the virus, but a second wave of the pandemic hit Senegal from November onwards, prompting the government to declare curfews for the two largest cities, Dakar and Thies.

Before COVID-19, GDP increased by 5.3% in 2019, but the economy contracted with 0.4% in 2020 due to the pandemic. Tourism, which represents 10% of GDP and 9% of total employment in the country, was heavily impacted.

In July 2020, the government adopted a bill exempting VAT for solar products, which came into effect in December. The new measure aims to reduce the acquisition costs of renewable energy production equipment by 18%.

Since October 2019, one factor positively influencing the PAYGo segment for SWPs in Senegal is the 2019-20 Global LEAP RBF incentives.⁵¹



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West Africa Insights



Senegal Insights

Sales Trends

Off-Grid Solar Lighting

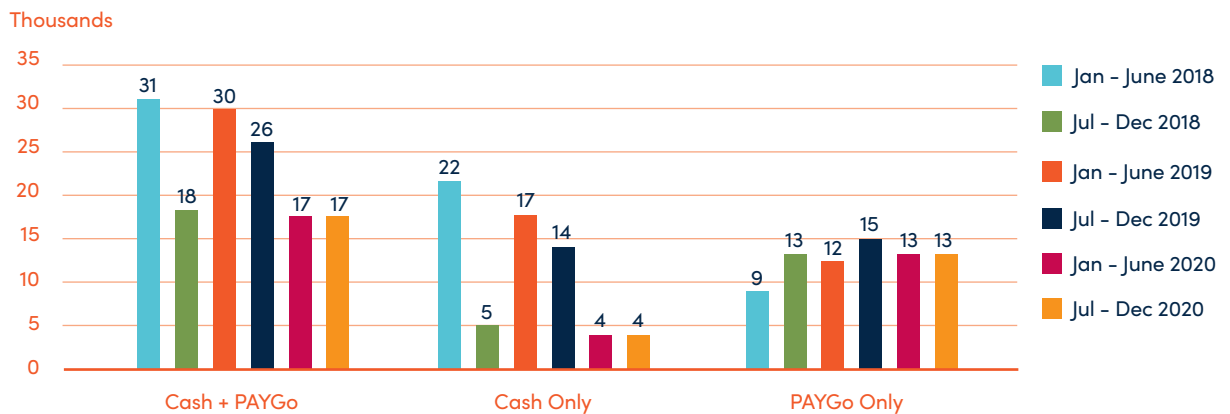
Sales of off-grid solar products in Senegal totaled 17,000 units between July and December 2020.

This is a 1% decrease compared to the first half of 2020, and a 33% drop in comparison with the second half of 2019. Both cash and PAYGo sales remained stable, with 4,000 and 13,000 units sold, respectively.

Off-Grid Solar Appliances

Between July and December 2020, the total recorded number of appliance sales in Senegal was close to 13,000 units. This is a 25% increase compared to the first half of 2020, but roughly the same volumes of the second half of 2019. TVs represent 54% of all appliances sold with around 7,000 units, followed by fans with around 6,000 units sold, representing 45% of total appliance sales. Affiliates reported 7 RUs and 176 SWPs sold in Senegal during the reporting period. Sales of other appliances do not pass three-data point control.

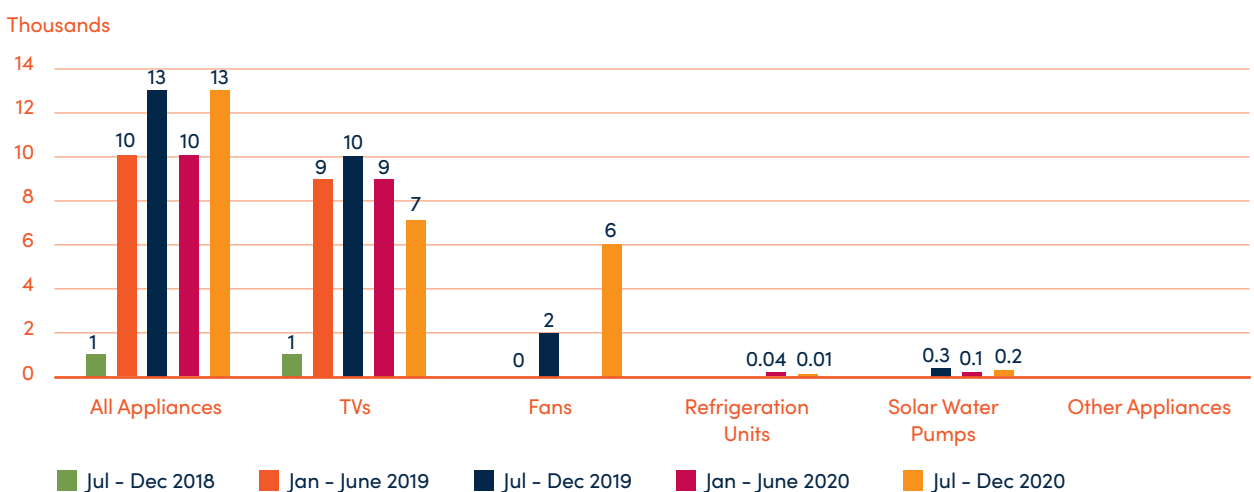
Figure 54 - Semi-annual Evolution of Volume of Lighting Products Sold - Senegal



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 instalments over time or pays for use of the product as a service.

Figure 55 - Semi-annual Evolution for Appliances Products - Senegal



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliances types that passed three-data point control any of the rounds are included in the figure.

West Africa Insights



Togo Insights

Background

To contain the COVID-19 outbreak, Togo took a series of strict measures in the beginning of the pandemic. Some of these measures were lifted from June onwards, with international flights resuming in August and churches and mosques reopening in October.

Due to the COVID-19 pandemic and containment measures, Togo recorded its first year without economic growth since 2005, and 62% of the workforce were affected by the crisis.⁵²

The government continues to partner with off-grid solar companies under the CIZO program to guarantee service in return for citizens receiving subsidies towards the cost of SHS electricity access. This helped in keeping sales volumes virtually unaffected in the first half of 2020, and a slight increase is even visible in the second half of the year. In December 2020, the government announced a 50% subsidy under the CIZO scheme to halve the cost of solar-powered farming and irrigation systems for 5,000 farmers.



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West Africa Insights



Togo Insights

Sales Trends

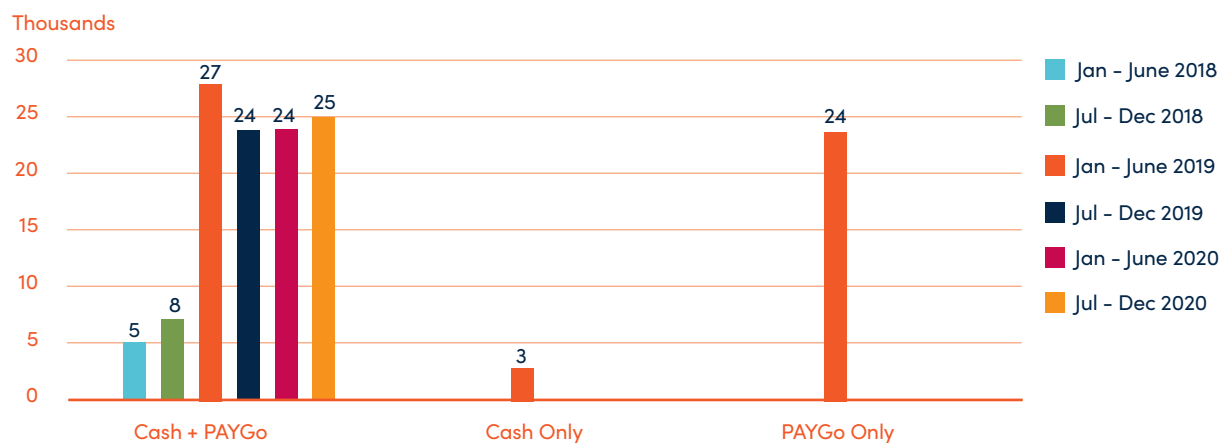
Off-Grid Solar Lighting

Sales of off-grid solar products in Togo totaled **25,000 units** between July and December 2020. This is an increase of 7% compared to both the first half of 2020 and the second half of 2019. No split can be observed between cash and PAYGo sales due to confidentiality rules.

Off-Grid Solar Appliances

Between July and December 2020, the total recorded number of appliance sales in Togo was **7,474 units**. This is a 25% increase compared to the first half of 2020, but a 3% decrease compared to the second half of 2019. Sales of RUs are marginal with 78 units sold. The sales of TVs and SWPs do not pass the three-data point confidentiality rule, while no sales were reported for fans and other appliances.

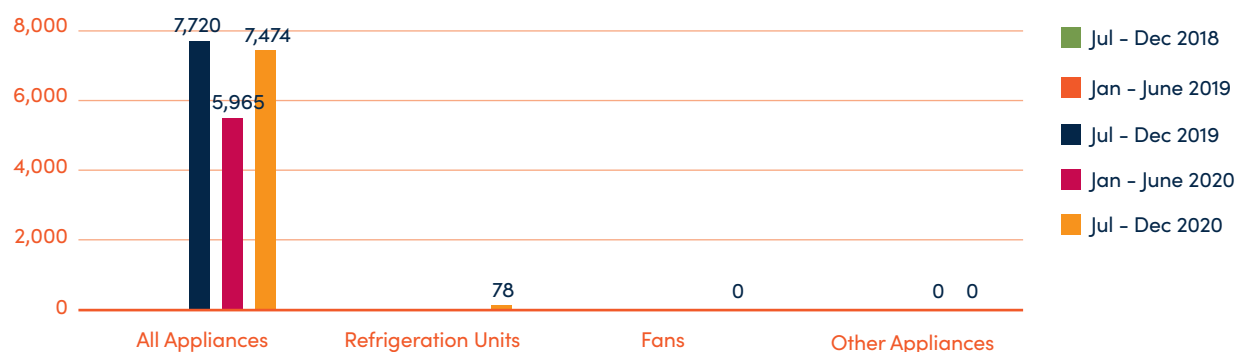
Figure 56 - Semi-annual Evolution of Volume of Lighting Products Sold - Togo



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 instalments over time or pays for use of the product as a service.

Figure 57 - Semi-annual Evolution for Appliances Products - Togo



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliance types that passed three-data point control any of the rounds are included in the figure.

West Africa Insights



Other West African Countries

Sales Trends

Off-Grid Solar Lighting

Benin's sales volume saw a 133% increase compared to the first half of 2020 and a 66% increase compared to the second half of 2019. Affiliates sold 48,000 units; the largest sales volumes recorded in the country since the reporting started. Future rounds will reveal if the growth trend continues or if it is connected to bulk procurements.

In the last reporting round, **Guinea** recorded over 2,000 units sold. This round, sales increased with 391% to around 12,000 units sold. Similar to Benin, these are the largest sales volumes recorded in the country since the reporting started, and future rounds will reveal if the growth trend continues.

Mali recorded a 61% increase, with over 19,000 units sold by affiliates. These volumes are 88% higher compared to the volumes reported in the second half of 2019. This increase is primarily due to sales in the cash segment, while PAYGo sales registered decreases.

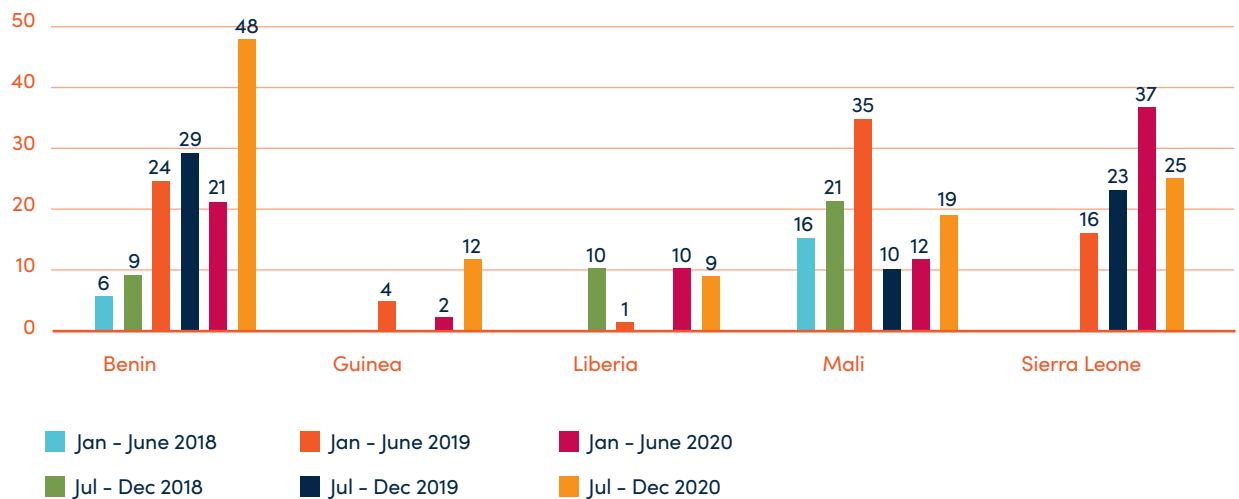
Affiliates reported around 9,000 units sold in **Liberia** between July and December 2020. This is a 12% drop compared to the first half of 2020.

In **Sierra Leone**, a 33% decrease in sales volume occurred compared to the first half of 2020, and a 10% increase compared to the second half of 2019, with sales volumes reaching 25,000 units.

Niger did not see enough companies reporting to show volumes this reporting round.

Figure 58 - Semi-annual Evolution of Volume of Lighting Products Sold - Other West African Countries

Thousands



West Africa Insights



Other West African Countries

Off-Grid Solar Appliances

Benin's sales volume saw an 82% increase compared to the first half of 2020 with around 12,000 units sold. This is also a 33% increase compared to the second half of 2019. Future rounds will reveal if the growth trend continues. Sales per appliances type cannot be shown as they do not pass the three-data point rule.

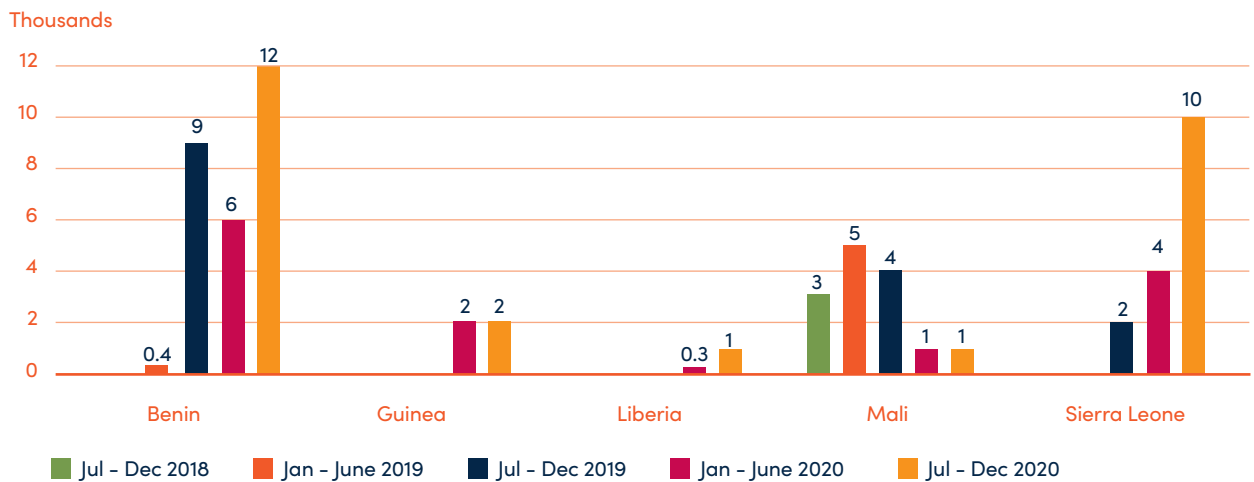
In the last reporting round, sales in **Guinea and Liberia** passed three-data point control for the first time since 2018, showing appliances sales of 2,000 and 300 units, respectively. Between July and December 2020, these numbers increased to 2,400 and 1,300 units sold.

In Guinea, 119 fans were sold while no sales were reported for SWPs. Sales of other appliance types cannot be included due to the low number of companies reporting. In Liberia, zero sales were recorded for SWPs and other appliances, while sales for TVs, fans and RUs cannot be disclosed for the same reason.

Affiliates reported around 1,000 units sold in **Mali** between July and December 2020, which is 30% less than the last reporting round and a 76% drop compared to the second half of 2019. Sales of TVs represent 70% of total appliance sales with 619 units. No sales were recorded for RUs and other appliances, and sales for fans and SWPs cannot be included due to the three-data point rule.

Sales of appliances in **Sierra Leone** reached around 10,000 units sold, 313% more than the volumes reported in the first half of 2020, and an increase of 376% compared to the second half of 2019. Fans represent 74% of total appliance sales. RUs recorded marginal sales with 53 units sold, and no sales were reported for other appliances. Sales for TVs and SWPs cannot be shared due to confidentiality rules.

Figure 59 - Semi-annual Evolution of Volume of Appliances Products Sold - Other West African Countries



NOTE:

The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units.



**Central
Africa
Insights**



Central Africa Insights



Sales Trends

Off-Grid Solar Lighting Products

Sales of off-grid solar products in Central Africa totaled 173,000 units between July - December 2020. This is a 33% increase compared to the first half of 2020, and a 40% increase compared to the same period in 2019.

The increase is primarily caused by a rise in cash sales, while PAYGo sales decreased compared to the first half of 2020. In this reporting round, 136,000 units were reported as sold in cash, with a value of US\$ 1.43 million. This is an 84% increase compared to the last reporting round and a 51% increase in comparison with the second half of 2019. PAYGo sales, with a value of US\$ 9.77 million, dropped with 34% compared to the first half of 2020 to 37,000 units. This is still a 10% increase compared to the second half of 2019.



Portable Lanterns

In the previous round, sales of portable lanterns without mobile charging - i.e. those with an indicative wattage of 0-1.499 Wp - did not pass the confidentiality rule. In this reporting round this category saw 36,000 sales, which is a 45% decrease compared to the second half of 2019.

Portable lanterns capable of charging mobile phones - i.e. with an indicative wattage of 1.5-2.999 Wp - experienced increased sales with 92,000 units sold. This is the second highest number recorded since reporting began, and a 261% increase compared to the first half of 2020.



Multi-light Systems

Central Africa recorded 16,000 multi-light systems sold between July and December 2020. This is considerably more than the 500 units sold in the last reporting round and a 36% increase compared to the second half of 2019.



Solar Home Systems (SHS)

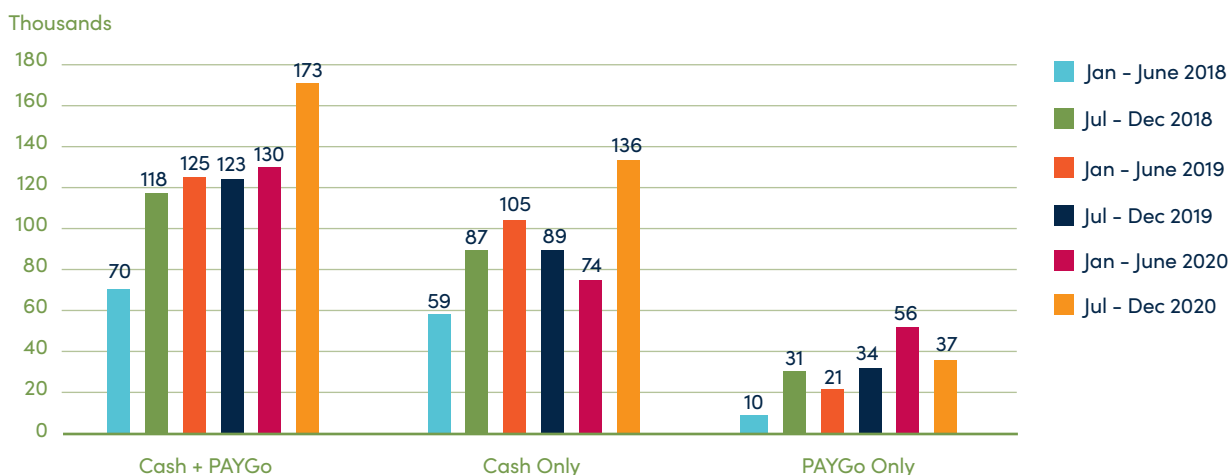
Less visibility is available at the product category level compared to East and West Africa. The 11-20 Wp and the 50-100 Wp categories posted the highest sales in the region. Affiliates reported over 5,000 sales in the 11-20 Wp category. This is a 286% increase compared to the second half of 2019. Data for the first half of 2020 is not available due to a low number of companies reporting.

In the 21-49 Wp category, 0 sales were recorded in the previous round. Companies did report sales in the second half of 2020, but these cannot be shared due to the three-data point rule.

The 50-100 Wp category was the only category that passed three-data point control last reporting round, showing 30,000 units sold. This round, affiliates reported 19,000 units sold, a decrease of 37%.

Similar to the last two reporting rounds, sales in the 100+ Wp category do not pass the confidentiality rule.

Figure 60 - Semi-annual Evolution of Volume of Products Sold - Central Africa

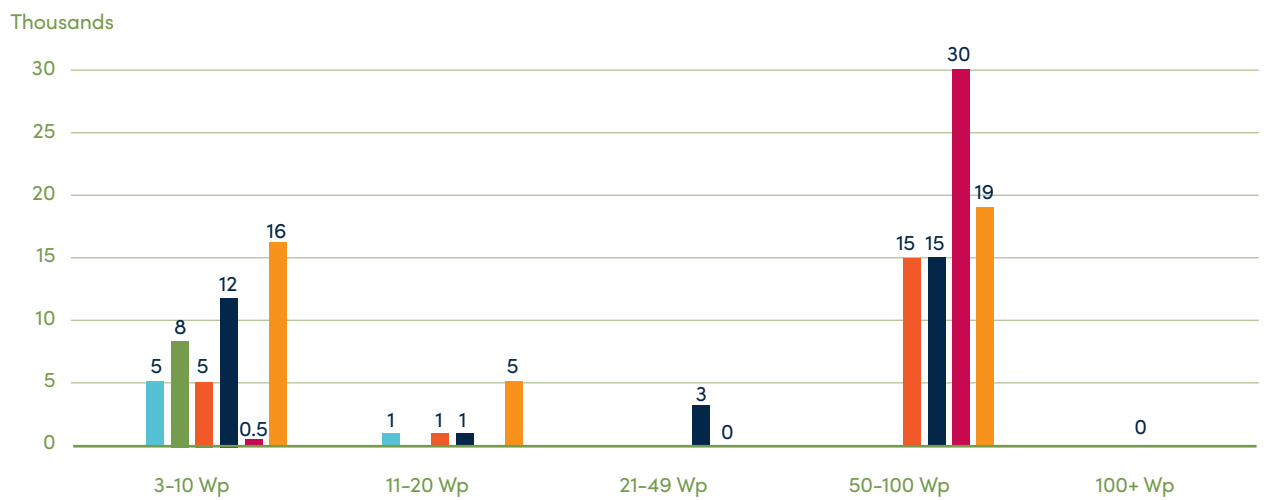
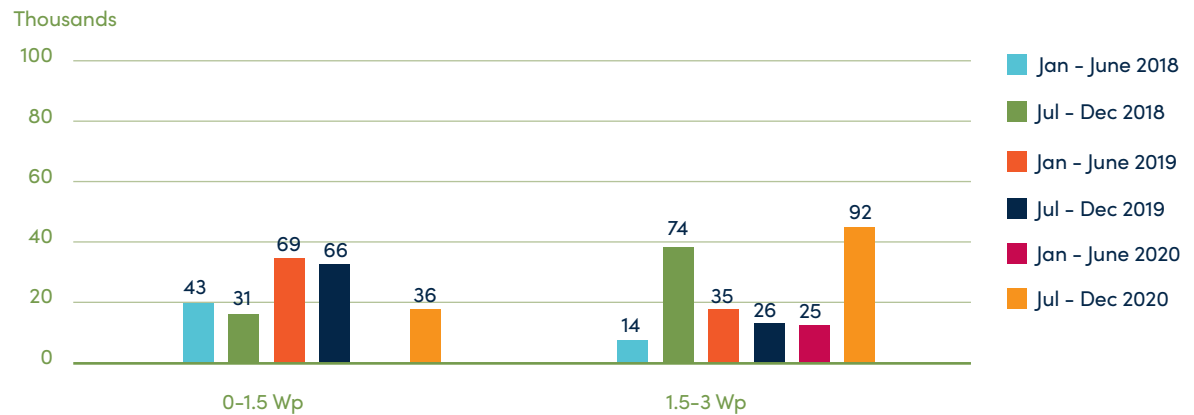


NOTE:

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 instalments over time or pays for use of the product as a service.

Central Africa Insights

Figure 61 - Semi-annual Evolution of Global Sales Volumes by Product Category - Central Africa



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.

Central Africa Insights

Off-Grid Solar Appliances

Between July and December 2020, the total recorded number of appliance sales in Central Africa reached around 17,000 units sold. This is a 26% decrease compared to the first half of 2020 and a 32% decrease compared to the second half of 2019. In general, Central Africa saw the largest relative decrease in appliances sales amongst the regions, closely followed by South Asia. The split between cash and PAYGo sales cannot be included due to the three-data point rule.

Appliance sales in Central Africa represent 6% of total appliance sales in sub-Saharan Africa (SSA). Fans sold in Central Africa account for 10% of total fans sales in SSA with 3,817 units. The sales of RUs remain marginal with 169 units, which is 6% of total RU sales in SSA. Sales TVs and solar water pumps did not pass three-data point control.



Fans

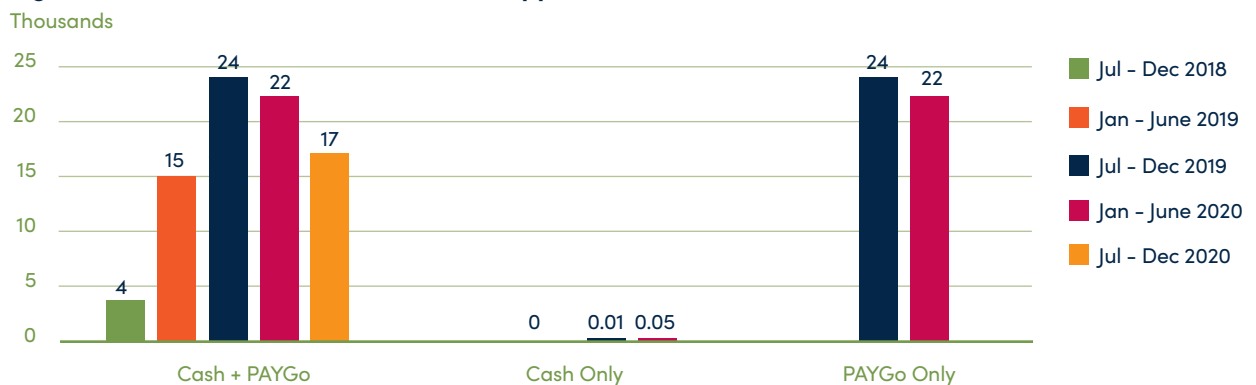
Sales for fans are visible for the first time since reporting began. Affiliates report 3,814 units sold in the first half of 2020. Most products (96%) are sold bundled with a power system. No split by cash or PAYGo sales can be offered as this point due to confidentiality rules.



TVs

In Central Africa, sales of TVs do not pass three-data point control for the first time since the second half of 2018. As a result, no trends can be observed or evaluated. Please see Figure 64 for the sales in previous rounds.

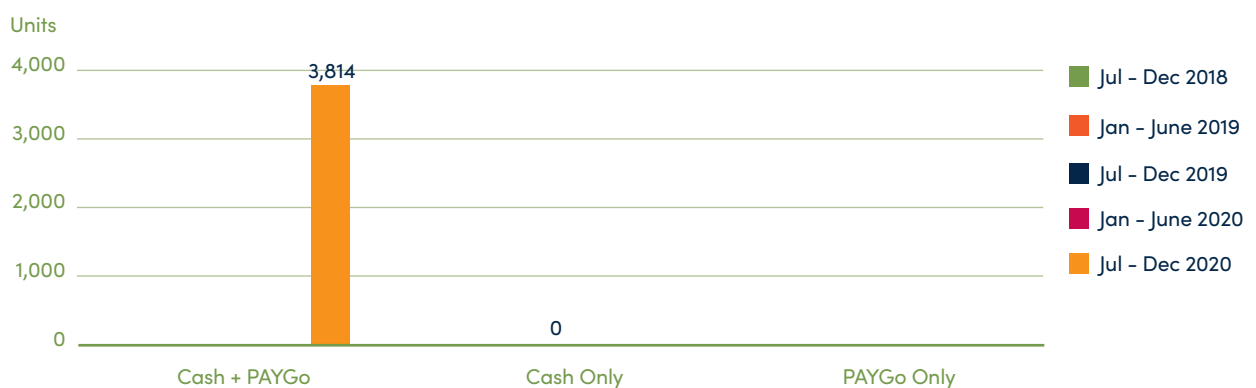
Figure 62 - Semi-annual Evolution for All Appliances - Central Africa



NOTE:

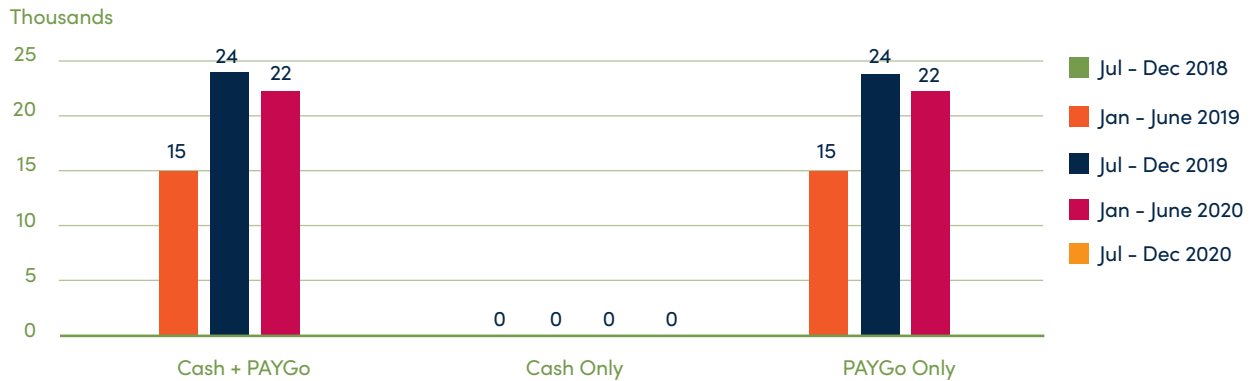
- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units.
- Products are classified as 'Cash' when sold in a single transaction (including products purchased via tenders), or as 'PAYGo', when the customer pays for the product in instalments over time or pays for use of the product as a service.

Figure 63 - Semi-annual Evolution for Fans - Central Africa



Central Africa Insights

Figure 64 - Semi-annual Evolution for TVs - Central 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 instalments over time or pays for use of the product as a service.



Refrigeration Units (RUs)

In Central Africa, volumes of RUs remain very low. Between July and December 2020, only 169 units were sold. Of the 169 units, 159 RUs reportedly sold with a power system. No insights can be provided on the split between cash and PAYGo as less than three companies reported in one or both segments. Given the small volumes, the trends are highly influenced by variable sales, therefore no comment can be made on the trajectory in the region for this appliance type.



Solar Water Pumps (SWPs)

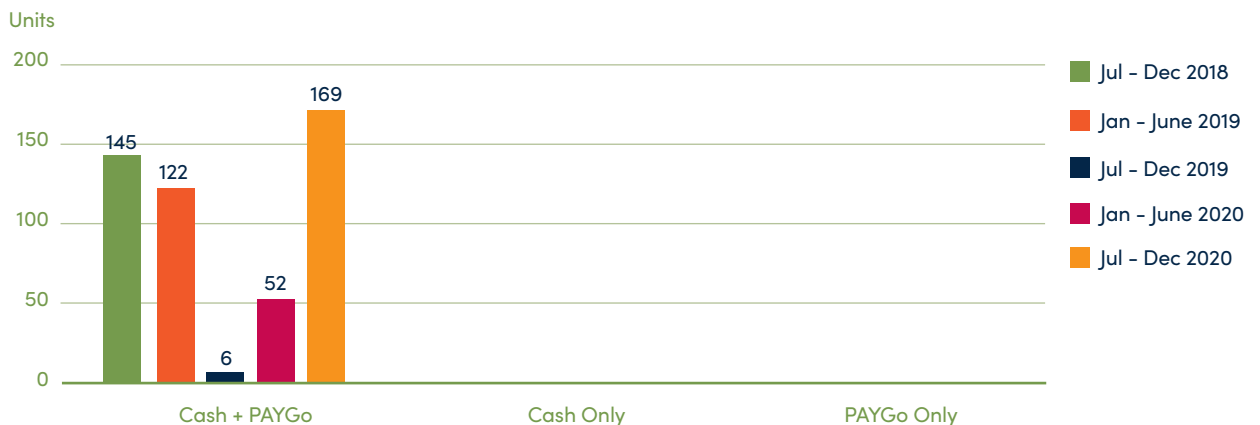
In Central Africa, companies do report sales, but these do not pass the confidentiality rule, similar to last reporting round. No company reported sales of SWPs in 2019 in this region.

Other Appliances

In Central Africa, companies also report sales of other appliances but these cannot be included due to three-data point control. This appliance type normally includes products such as **agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery.**

Radios are excluded from both 'All Appliances' and 'Other Appliances', as they are regularly sold bundled with lighting systems and their large volumes would bias the overall results. **More than 21,000 radios were sold in Central Africa in the second half of 2020.**

Figure 65 - Semi-annual Evolution for RUs - Central 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 instalments over time or pays for use of the product as a service.

Central Africa Insights



Cameroon Insights

Background

The government took several containment measures at the beginning of the COVID-19 pandemic in March. While infection rates were low from July until September, they increased in the last months of the year.

Due to the COVID-19 crisis, the economy contracted with 2.4%, compared to 3.7% growth in 2019. Informal sector workers, which account for 90% of all employment and are mainly women, are most directly impacted by health risks and loss of income. It is expected that the effects will lead to a decline in consumption and investment into 2021.⁵³

USAID / Power Africa announced four grants totaling US\$ 788,000 for selected off-grid solar companies in the first half of 2020 to expand off-grid energy access in Cameroon, DRC and Sierra Leone. This funding likely positively affected sales in Cameroon in the second half of the year.

Sales Trends

Off-Grid Solar Lighting

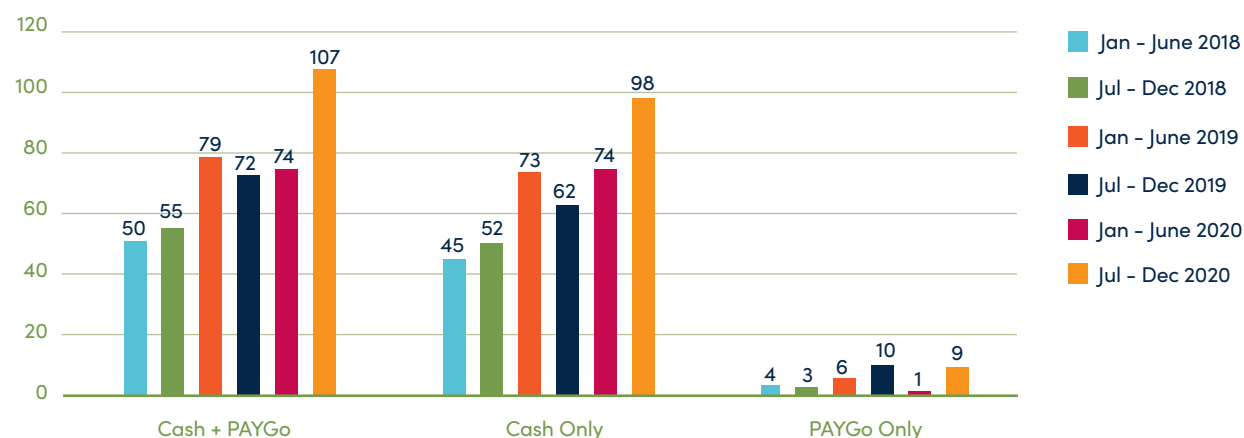
Sales of off-grid solar products in Cameroon totaled 107,000 units between July and December 2020, the highest number recorded since reporting began. This is a 44% increase compared to the first half of 2020, and a 49% increase in comparison with the second half of 2019. While PAYGo sales almost fell to 0 last reporting round, sales increased again to over 9,000 in this round, which is still a 4% decrease compared to the second half of 2019. Cash sales increased with 33% compared to the first half of 2020 to 98,000 units sold. This is an increase of 57% compared to the second half of 2019.

Off-Grid Solar Appliances

While sales of lighting products increased considerably, sales of appliances products are still low. This can partly be explained because portable lanterns - which are too small to power appliances - make up 87% of total lighting product sales. In this reporting round, affiliates did not report any sales of TVs, fans, SWPs or other appliances. Companies did report sales of RUs, but these cannot be shared due to the three-data point rule.

Figure 66 - Semi-annual Evolution of Volume of Lighting Products Sold - Cameroon

Thousands



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 instalments over time or pays for use of the product as a service.

Central Africa Insights



Democratic Republic of Congo (DRC) Insights

Background

Early in the COVID-19 pandemic, the government of DRC declared a state of emergency and imposed the confinement of the capital, Kinshasa. From June onwards, restrictions were gradually lifted, but after a second wave in December, the government announced new measures, including a curfew.

Due to the COVID-19 crisis, the country's economy contracted by 1.7%, the first recession in 25 years. This will likely have an impact on employment rates and the purchasing power of off-grid solar customers. In addition, DRC has been struggling with deteriorating exchange rates for some time now, and for off-grid solar companies this can be a barrier to finance from international investors.

USAID / Power Africa announced four grants totaling US\$ 788,000 for selected off-grid solar companies in the first half of 2020 to expand off-grid energy access in Cameroon, DRC and Sierra Leone. This funding likely positively affected sales in DRC in the second half of the year.

In addition, the World Bank launched a result-based financing scheme (RBF) through the EASE project in December, which supports four off-grid solar companies in distributing quality verified products. This will likely positively impact sales in 2021.



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Central Africa Insights



Democratic Republic of Congo (DRC) Insights

Sales Trends

Off-Grid Solar Lighting

Sales of off-grid solar products in DRC totaled **51,000 units** between July and December 2020.

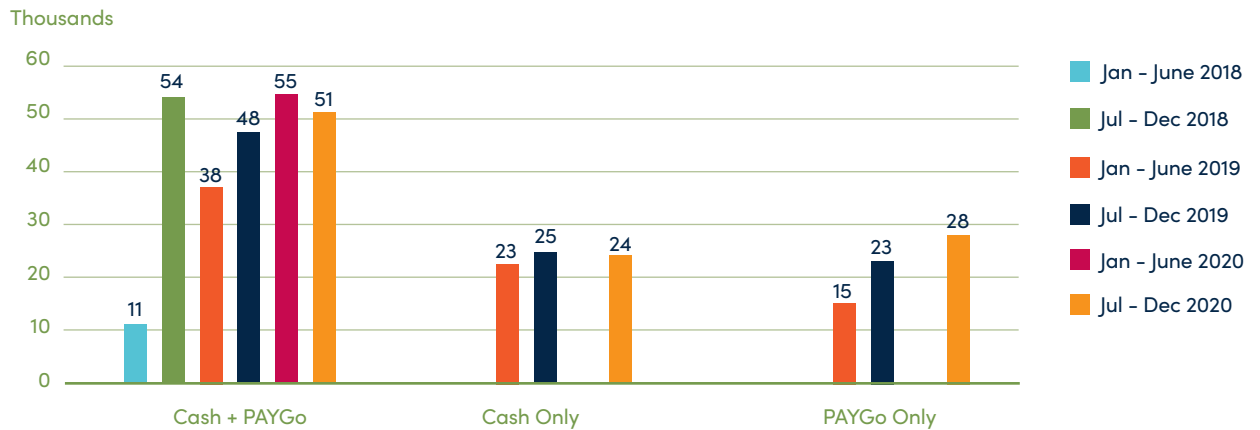
This is a 7% decrease compared to the first half of 2020, and a 7% increase compared to the second half 2019. The split between cash and PAYGo was not shown last round, due to confidentiality rules, but is visible this round. Cash and PAYGo sales each represent roughly half of total sales. Cash sales decreased with 3% compared to the second half of 2019, while PAYGo sales increased with 16% compared to the same period.

Off-Grid Solar Appliances

Between January and June 2020, the total recorded number of appliance sales in DRC were around **16,000 units**.

This is a 26% decrease compared to the first half of 2020 and a 32% decrease in comparison to the second half of 2019. Sales of TVs, fans, RUs and other appliances did not pass three-data point control, while no companies reported sales of SWPs.

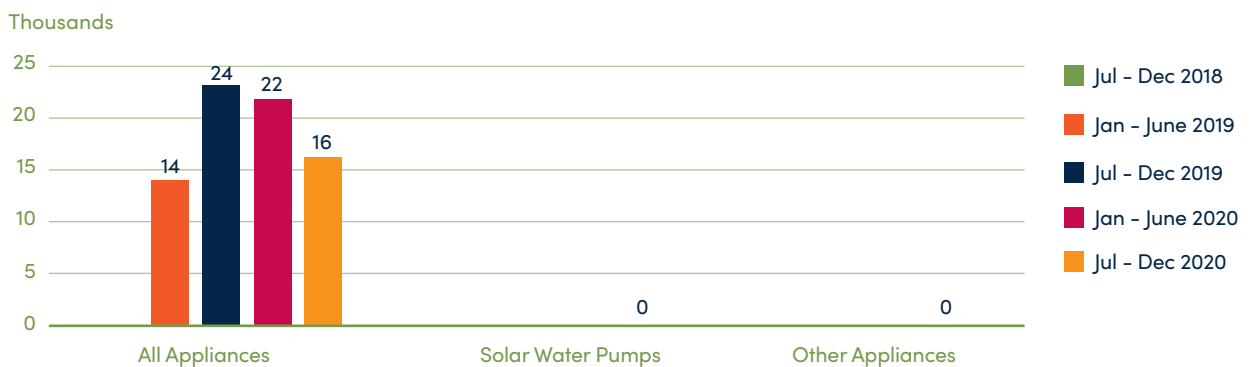
Figure 67 - Semi-annual Evolution of Volume of Lighting Products Sold - DRC



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 instalments over time or pays for use of the product as a service.

Figure 68 - Semi-annual Evolution for Appliances Products - DRC



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliance types that passed three-data point control any of the rounds are included in the figure.



**South
Asia
Insights**



South Asia Insights



Sales Trends

Off-Grid Solar Lighting Products

Sales of off-grid solar products in South Asia totaled 479,000 units between July - December 2020, the lowest volumes recorded since regional reporting began in 2015. As visible in Figure 69, the downward trend continued since the second half of 2018 and was accelerated by the COVID-19 crisis in 2020. However, sales volume remained fairly stable for the first time with a 3% drop compared to the first half of 2020. This is 43% lower in comparison with the second half of 2019.

For the first time since the second half of 2018, it is not possible to show the split between cash and PAYGo sales due to confidentiality rules, as too few companies reported sales in one or both categories.

half of 2019. The drop in this and the previous round can partly be explained by companies that did report in 2019 but did not report in 2020.



Multi-light Systems

South Asia recorded slightly over 101,000 multi-light systems sold between July and December 2020 and represented 21% of the regional sales. This is the only other product category that saw an increase compared to the first half of 2020, of 17%, and a 53% increase in comparison with the volumes recorded in the second half of 2019.



Portable Lanterns

Portable lanterns total sales reached 368,000 units in South Asia, 77% of the region's sales.

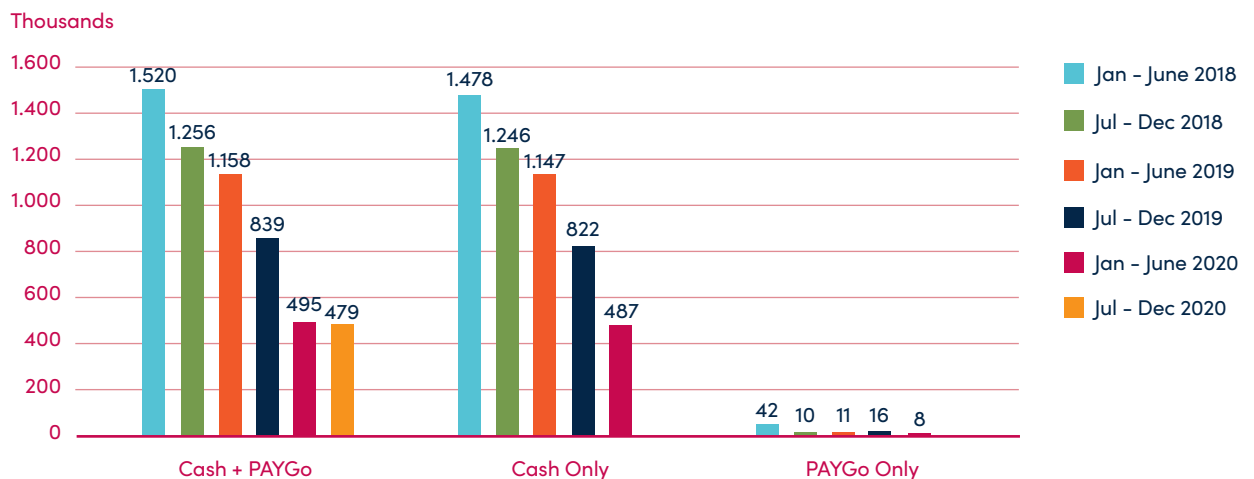
Affiliates reported 227,000 sales units of portable lanterns without mobile charging - i.e. those with an indicative wattage of 0-1.499 Wp. This is a 32% increase compared to the first half of 2020, but a 7% decrease compared to the second half of 2019. Portable lanterns capable of charging mobile phones - i.e. those with an indicative wattage of 1.5-2.999 Wp - experienced a decrease of 18% with sales of 141,000 units compared to the first half of 2020 and a 67% decrease compared to the second



Solar Home Systems (SHS)

Around 11,400 SHS were sold in South Asia in the second half of 2020. This is an 83% decrease compared to the first half of 2020 and an 89% decrease compared to the second half of 2019. All categories experienced significant decreases, with the biggest relative change in the 100+ Wp category. This drop can partly be explained by the lower number of companies reporting in the region than in previous rounds.

Figure 69 - Semi-annual Evolution of Volume of Products Sold - South Asia



NOTE:

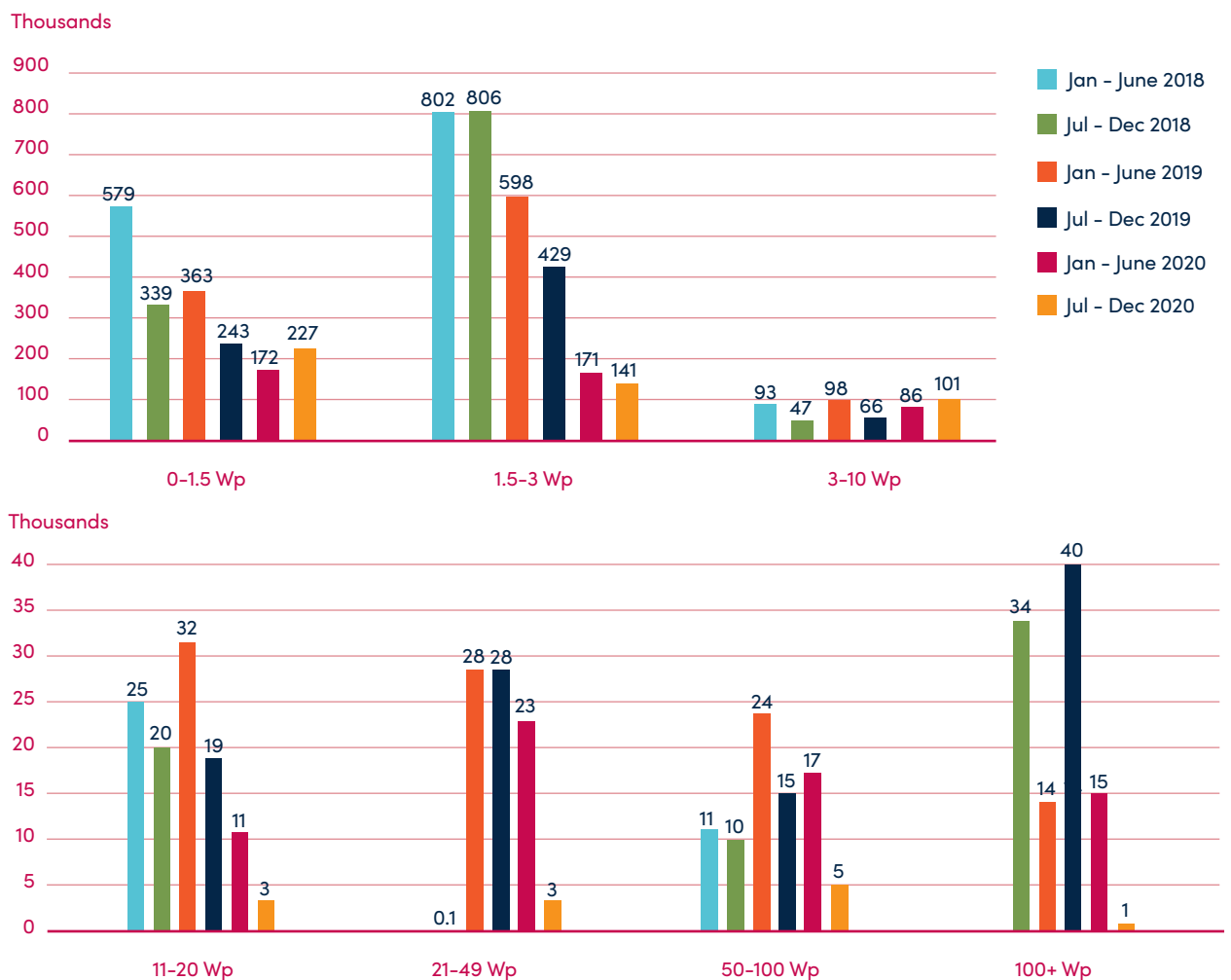
Products are classified as 'Cash', when sold in a single transaction (including products purchased via tenders), or as 'PAYGo', when the customer pays for the product in instalments over time or pays for use of the product as a service.

South Asia Insights

While the 21-49 Wp category remained relatively stable, as the bestseller in the region in the last two reporting rounds, it is now seeing around a 90% decrease compared to the first half of 2020 and the second half of 2019, with 2,800 units sold. The 11-20 Wp category, already on a downward trend, experienced another 69% drop compared to the first half of 2020 and recorded 3,200 units sold. Sales in 100+ Wp category saw a decrease of 95% falling to 770 units, the lowest number since reporting began.

In the last reporting round, the 50-100 Wp segment was the only category that experienced growth in the region, and excluding the outlier in the first half of 2019, a growth trajectory is observed for this SHS segment. However, in the first half of 2020, this growth halted as sales dropped by 74% to slightly over 4,500 units.

Figure 70 - Semi-annual Evolution of Global Sales Volumes by Product Category - South Asia



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.

South Asia Insights

Off-Grid Solar Appliances

Between January and June 2020, the total recorded number of appliance sales in South Asia reached 179,000 units. This is a 23% decrease compared to the first half of 2020. Fans represent nearly 100% of the sales in South Asia, and sales have a strong seasonal pattern, with the first half of the year reporting larger sales than the second half. Compared to the second half of 2019, appliances sales increased 29%.

In this reporting round, all fans were sold through cash in the region, which means that the total increase occurred in that segment.



Fans

South Asia remains the largest regional market for this appliance type with 178,000 units sold between July and June 2020. These volumes show a 23% increase compared to the first half of 2020. However, a more appropriate comparison should be drawn with the second half of 2019. This is because there is a seasonal pattern in the sales in countries like Pakistan and Bangladesh – highlighted anecdotally by the companies and observable in the sales data trends. 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. Therefore, comparing the sales of the second half of 2020 with the volumes in the same period of 2019 is more accurate. This way a significant 61% increase in sales can be observed.

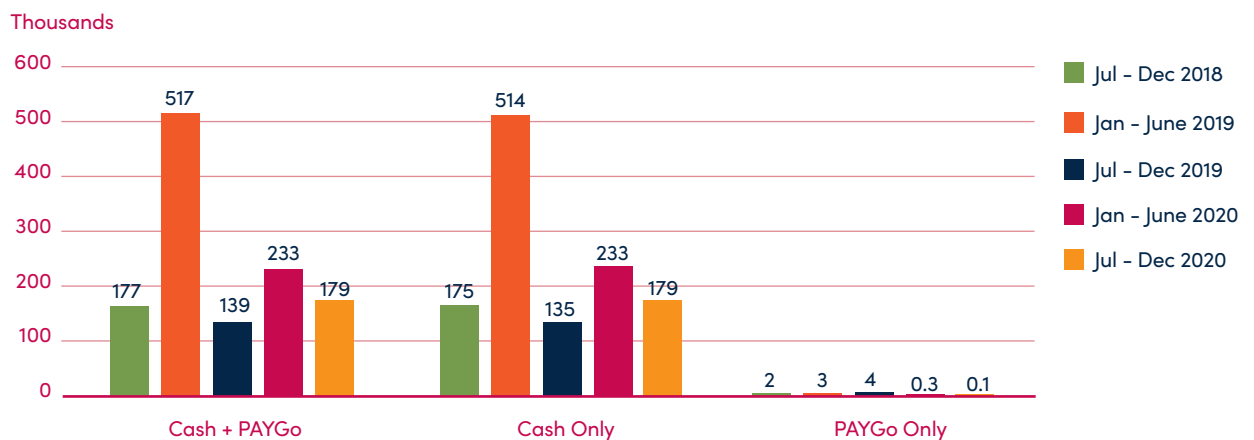
Contrary to sales in West Africa, only 2% of the fans are sold bundled with a power system, and all products reported this round sold on a cash basis.

In terms of the portfolio of product categories sold, Figure 73 shows that in South Asia pedestal fans are most sold at 78,000 units. Table fans follow with around 23,000 units sold in the first half of 2020.

Ceiling fans are usually the most sold fan product in South Asia. Anecdotally, the prevalence of ceiling fans in South Asia is due to more mature country markets for AC products, which have diversified to produce DC fans to meet growing off-grid market demand. However, this segment cannot be included this reporting round due to the three-data point rule.

Key differences with West Africa are that the order of magnitudes of the two visible categories is completely reversed and that very few fans are sold bundled with a power system. 12% of table fans are sold together with a SHS, while this is less than 1% for pedestal fans.

Figure 71 - Semi-annual Evolution for All Appliances - South Asia

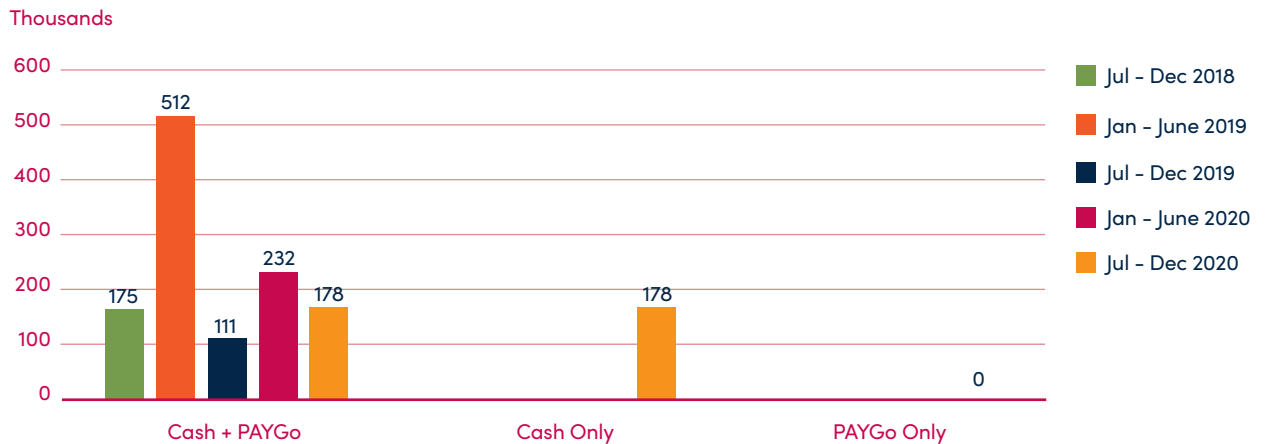


NOTE:

- The category 'All 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 instalments over time or pays for use of the product as a service.

South Asia Insights

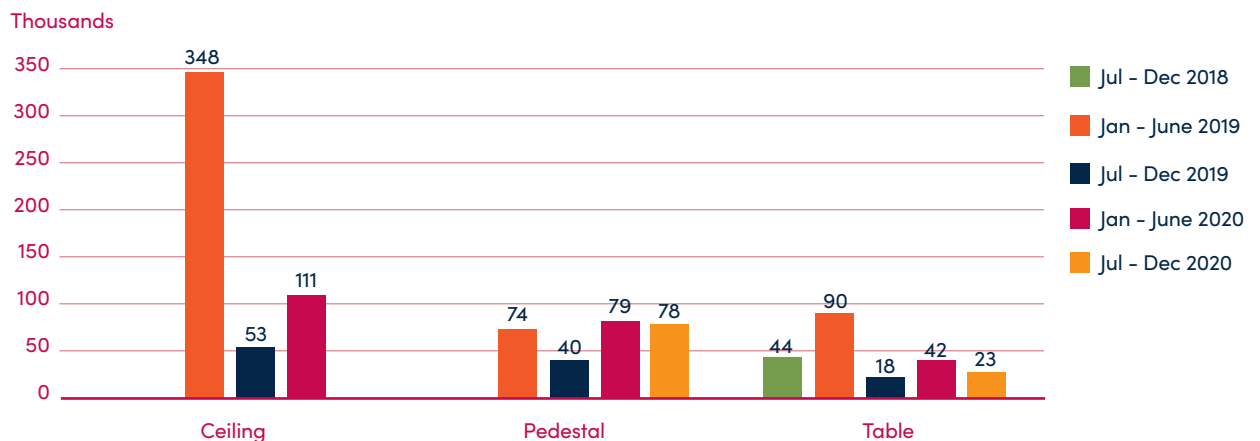
Figure 72 - Semi-annual Evolution for Fans - South Asia



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 instalments over time or pays for use of the product as a service.

Figure 73 - Semi-annual Evolution of Fans by Product Category - South Asia

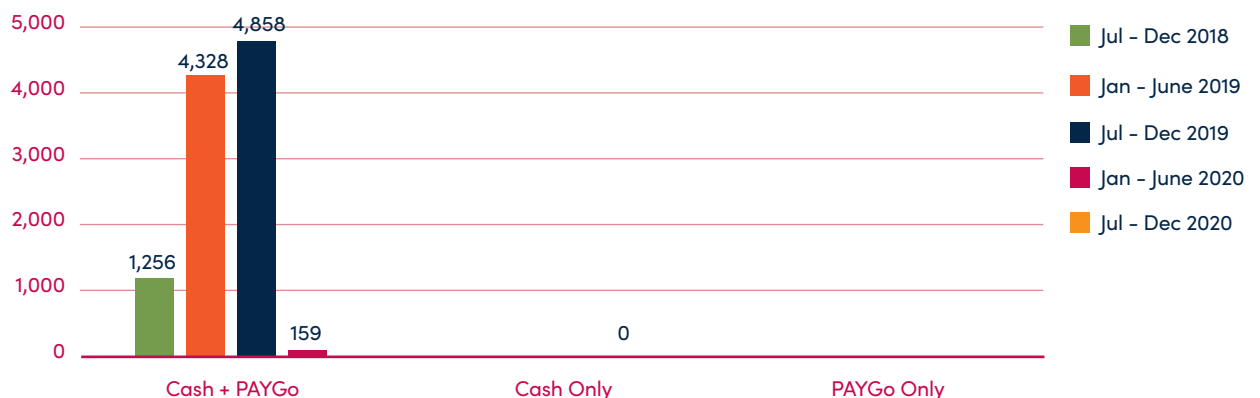


TVs

In South Asia, companies report sales of TVs, but these do not pass the confidentiality rule and cannot be included. In the first half of 2020,

affiliates reported 159 units sold. Please see Figure 74 for the evolution of TV sales over the last four reporting rounds.

Figure 74 - Semi-annual Evolution for TVs - 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 instalments over time or pays for use of the product as a service.

South Asia Insights



Refrigeration Units (RUs)

Similar to TVs, the sales for RUs cannot be included as too few companies reported sales. In the last round, companies reported 188 units sold, of which 122 RUs were reported to be sold with a power system. Please see Figure 75 for the evolution of RU sales over the last four reporting rounds.



Solar Water Pumps (SWPs)

In South Asia, sales of SWPs dropped slightly to 616 units, an 8% decrease compared with the first half of 2020. 61% of SWPs are reported sold together with a power system in South Asia, which only accounted for 13% in the last reporting round. Note that we currently have very limited visibility of the significant volume of solar water pumps being sold in the region.

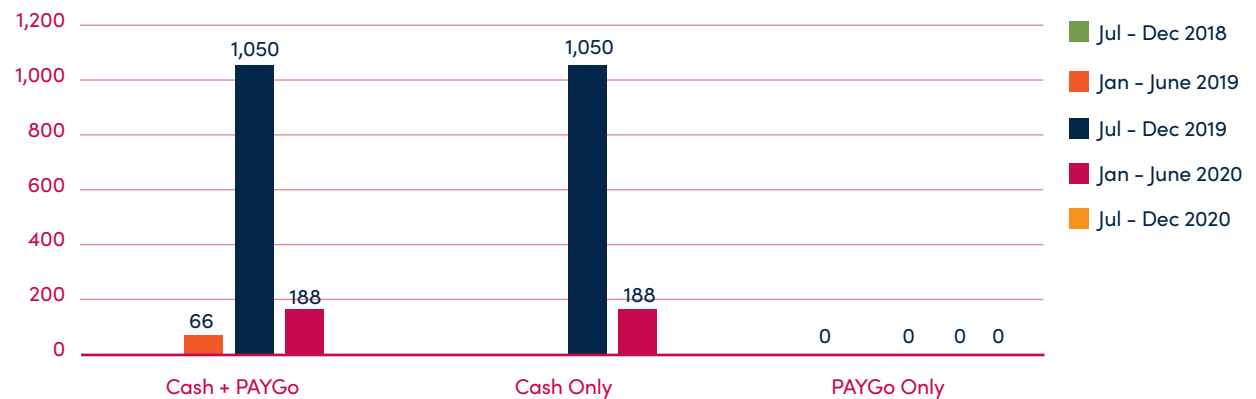
Other Appliances

In regard to other appliances, 0 sales were recorded. This is a drop from 1,472 units sold in the first half of 2020, all of which sold in cash.

These units are not reflected in 'All Appliances' and **include products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery.** Currently, if separated, these volumes would not pass our confidentiality rules. For the time being, they will be reported together, while their progress is monitored.

Radios are excluded from both 'All Appliances' and 'Other Appliances', as they are regularly sold bundled with lighting systems and their large volumes would bias the overall results. **No radios were reportedly sold in South Asia in the second half of 2020.**⁵⁴

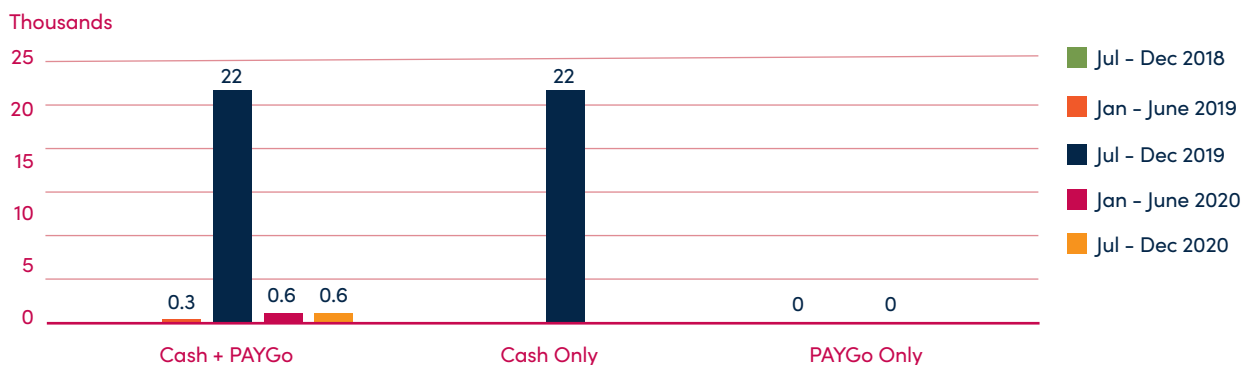
Figure 75 - Semi-annual Evolution for RUs - South Asia



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 instalments over time or pays for use of the product as a service.

Figure 76 - Semi-annual Evolution for SWPs - 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 instalments over time or pays for use of the product as a service.
- The large volumes reported in the second half of 2019 were due to bulk procurements in the cash segment under schemes such as the 'KUSUM' scheme in India.

⁵⁴ Radios are primarily sold bundled with a power system in sub-Saharan Africa. While the total sales number in South Asia is 0, they are reported separately for consistency.



India Insights

Background

In the beginning of the COVID-19 pandemic, the Indian Government imposed a lockdown on the entire country, with localized lockdowns until late August. The economic impact of COVID-19 has been substantial, and companies reportedly came to almost a complete halt at times. The Indian economy contracted by 9.6% in 2020 due to the pandemic, with poorer households particularly affected. In response, the Indian government announced several stimulus packages with a total worth of US\$ 15 billion (15% of GDP), including credit-guarantees for small and medium enterprises and US\$ 200 million business loans for rural companies through the rural development fund.⁵⁵

Microfinance institutions (MFIs), the main distribution channel for off-grid solar products, were more affected by the crisis than banks, given that the Central Bank of India allowed a 3-months loan moratorium at the beginning of the pandemic for bank borrowers, but not MFIs. This aggravated the situation for the MFI borrowers, already suffering from jobs and income losses. Yet, the agricultural sector in India proved to be quite resilient, and the incomes of rural farmers remained relatively stable, which had a positive impact on repayment rates.

Other factors that influenced sales in India over the past few rounds are the 99.99% electrification

rate reached through the grid extension under the 'Saubhagya' initiative in 2019, and the duty on import of solar products to stimulate local manufacturing. Moreover, **companies have anecdotally shared that off-grid customer demand is shifting towards larger systems which can offer more energy services, as well as components such as DC light bulbs and inverters.**

Sales Trends

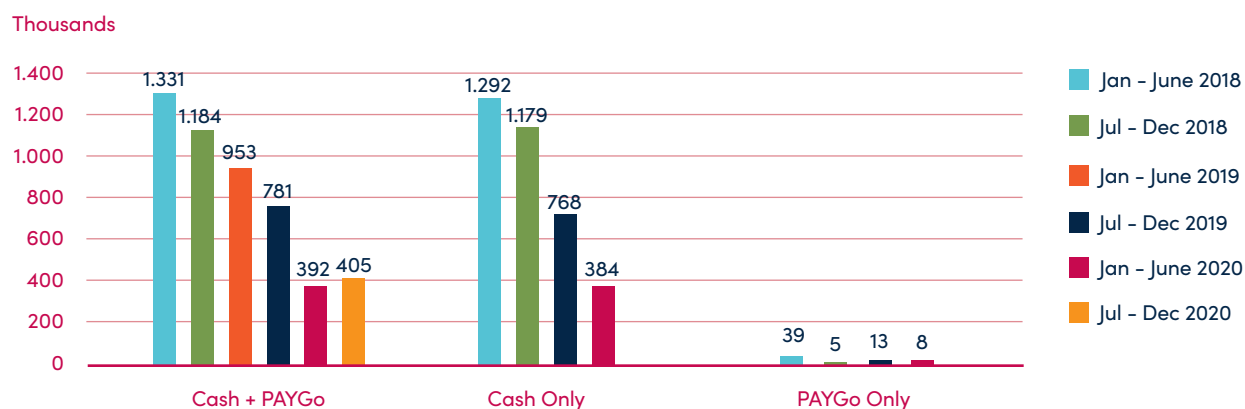
Off-Grid Solar Lighting

Sales of off-grid solar products in India totaled 405,000 units between July and December 2020.

Sales have been on a downward trend since 2018, which seems to have been accelerated by the COVID-19 crisis. After reaching the lowest volumes on record in the last reporting round, volumes increased slightly by 3% compared to the first half of 2020. However, this is a 48% decrease compared to the second half of 2019. It is not possible to show the split between cash and PAYGo sales due to confidentiality rules.

Sales in the two portable lanterns segment increased with 28% (0-1.499 Wp) and 19% (1.5-2.999 Wp) compared to the first half of 2020, while multi-light systems saw a 42% decrease in volumes compared to the last round. In the SHS product category, no sales were reported in the 50-100 Wp segment, while sales in the other three segments cannot be included due to the low number of companies reporting sales.

Figure 77 - Semi-annual Evolution of Volume of Lighting Products Sold - India



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 instalments over time or pays for use of the product as a service.

South Asia Insights



India Insights

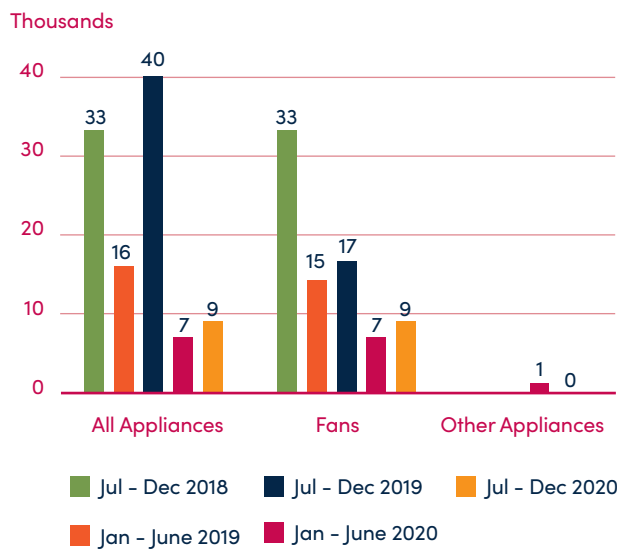
Off-Grid Solar Appliances

Between July and December 2020, the total recorded number of appliance sales in India was around 9,000 units. This figure almost entirely consists of fans. Unlike Pakistan and Bangladesh, the sales of fans do not seem to follow a seasonal pattern. This is because for this report there is closer engagement with B2C distributors in India, which sell the systems in the second half of the year, while in Pakistan and Bangladesh, more B2B

companies are involved which sell to distributors in the first half of the year.

Sales of appliances have increased 30% compared to the first half of 2020 but decreased 77% in comparison with the second half of 2019. Affiliates reported sales of TVs, RUs and SWPs, but these cannot be included due to the three-data point rule. No sales were reported for other appliances.

Figure 78 - Semi-annual Evolution for Appliances Products - India



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliance types that passed three-data point control any of the rounds are included in the figure.



South Asia Insights



Pakistan Insights

Background

At the start of the COVID-19 pandemic, federal and provincial Pakistani governments implemented measures to contain and mitigate the spread of the virus. Despite these restrictions, daily infection rates increased in June, before stabilizing in September. In November, the country experienced a second wave of infections, prompting the government to again impose restrictions.

The COVID-19 measures and the 5% depreciation of the Pakistani rupee impacted the purchasing power of customers. The economy contracted by 0.4% but is expected to grow again with 2% in 2021. While in the beginning of the year companies reported that their operations in rural areas often came to complete halt due to the inability to travel, the situation improved again in the second half of the year, increasing sales numbers.

On a positive note, in August, the German Development Bank (KfW) provided the first US\$ 5.8 million loan (of in total US\$ 17 million) to the Pakistan Microfinance Investment Company (PMIC), a wholesale lender to microfinance institutions. PMIC will provide credit lines to microfinance institutions that will then on-lend to customers purchasing SHS.

In addition, the Sindh Solar Energy project, financed by the World Bank, is expected to come online in the beginning of 2021. The project includes a US\$ 30 million off-grid solar component which aims to provide 200,000 households in the Sindh province with SHS. A consumer awareness campaign will run on prime-time TV in the ten districts with the lowest access to energy.



© NIWA



Pakistan Insights

Sales Trends

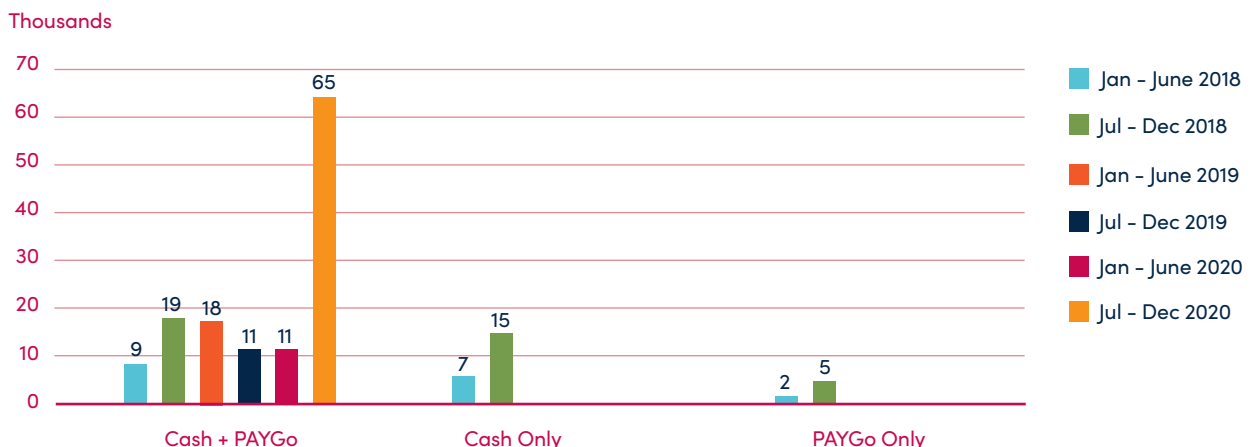
Off-Grid Solar Lighting

Sales of off-grid solar products in Pakistan totaled 65,000 units between July and December 2020. This is the highest number since recording began, and a significant increase of 483% compared to both the first half of 2020, and the second half of 2019. Companies anecdotally shared that this high number is related to bulk procurement sales. It is not possible to include the split between cash and PAYGo due to the three-data point rule.

Off-Grid Solar Appliances

Due to a low number of companies reporting appliances sales in Pakistan, it is not possible to include total sales numbers for the second half of 2020. In the first half of 2020, the total recorded number of appliance sales in Pakistan were 185,000 units, almost all fans. Higher sales numbers in the first half of the year are often due to the seasonal pattern in the sales of fans, which operate through a pre-booking system, causing distributors to purchase fans in bulk quantity early in the year and then selling stock to end-users during the hottest months. Companies did not report sales for TVs, RUs, SWPs and other appliances.

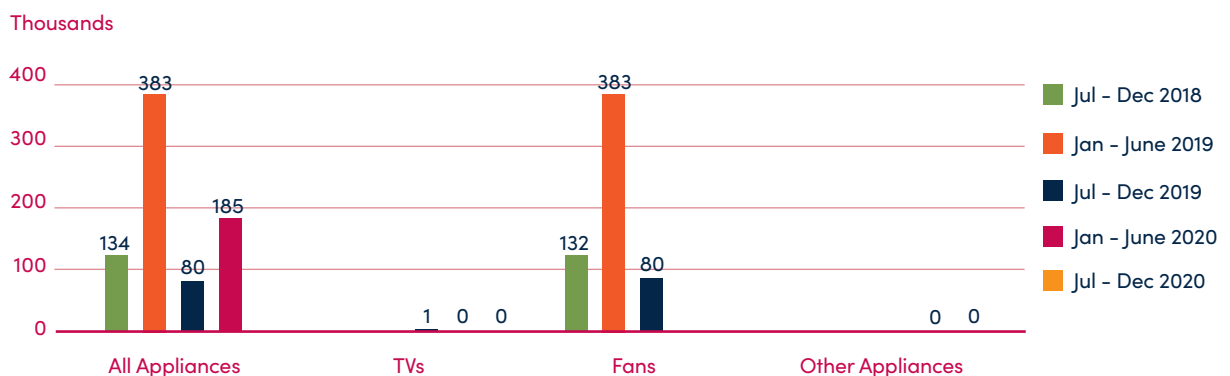
Figure 79 - Semi-annual Evolution of Volume of Lighting Products Sold - Pakistan



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 instalments over time or pays for use of the product as a service.

Figure 80 - Semi-annual Evolution for Appliances Products - Pakistan



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliances types that passed three-data point control any of the rounds are included in the figure

South Asia Insights



Other South Asian Countries

Sales Trends

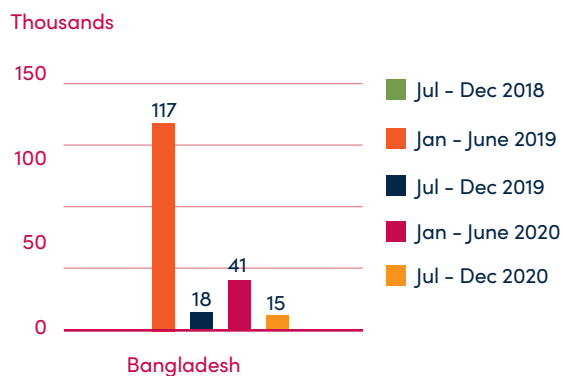
Off-Grid Solar Lighting

For the first time since 2016, lighting product sales for **Bangladesh** cannot be included due to a low number of companies reporting this round. Note that there are usually higher sales in the first half of the year in Bangladesh due to bulk procurement sales linked to humanitarian efforts.

Off-Grid Solar Appliances

Off-grid appliances sales totaled over 15,000 units in **Bangladesh**, all sold via cash. No sales were recorded for TVs and other appliances, while sales for fans, RUs and SWPs cannot be included due to the three-data point rule.

Figure 81 - Semi-annual Evolution of Volume of Appliances Sold - Other South Asian Countries



NOTE:

The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units.





East Asia & Pacific Insights



East Asia & Pacific Insights



Sales Trends

Off-Grid Solar Lighting Products

Sales of off-grid solar products in East Asia & Pacific totaled 147,000 units sold between July - December 2020. This is almost a 100% increase compared to the first half of 2020, when the lowest volumes were recorded since the regional reporting started in 2015. Contrary to South Asia, the region was not experiencing a downward trend, therefore it is reasonable to assume that the COVID-19 crisis caused this decline in the sales volumes of the last reporting round. Compared to the second half of 2019 - a record reporting period - the sales volume has seen a 40% drop.

Both cash and PAYGo experienced large relative increases, but given the different magnitude of volumes involved, cash sales are more significant.

Around 131,000 units were sold on a cash basis, with a value of US\$ 7.87 million. This is a 102% increase compared to the sales volumes of the first half of 2020 and 41% less than the second half of 2019. On the other hand, 16,000 units were reported sold via PAYGo, with a value of US\$ 2.12 million. This is 78% more in sales volume than the last reporting round and a 33% decrease in comparison with the second half of 2019.



Portable Lanterns

Total sales of portable lanterns was 89,000 units in East Asia & Pacific, amounting to 60% of the region's sales. Affiliates sold 64,000 units of portable lanterns without mobile charging - i.e. those with an indicative wattage of 0-1.499 Wp. This is a 115% increase compared to the first half of 2020 and a 40% one compared to the second half of 2019. The sharp increase in sales of this segment is also tied to a bulk procurement in this region this round. Portable lanterns capable of charging mobile phones - i.e. those with an indicative wattage of 1.5-2.999 Wp - experienced relatively stable sales of around 25,000 units compared to the first half of 2020 and the second half of 2019.

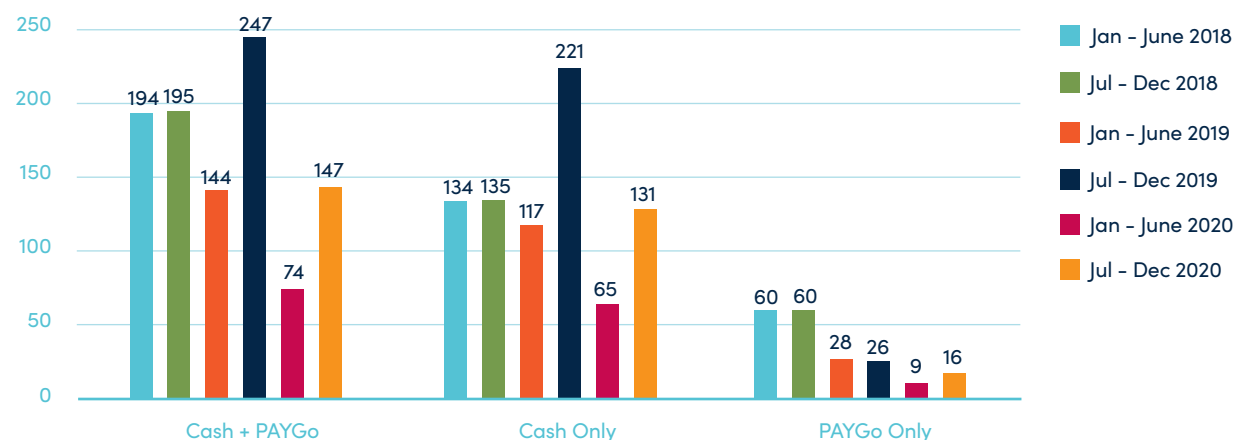


Multi-light Systems

East Asia & Pacific recorded slightly over 27,000 multi-light systems sold between July and December 2020 and represented 18% of the regional sales. This category saw increased sales of 103% compared to the first half of 2020 but a 9% decrease from the volumes recorded in the second half of 2019.

Figure 82 - Semi-annual Evolution of Volume of Products Sold - East Asia & Pacific

Thousands



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 instalments over time or pays for use of the product as a service.

East Asia & Pacific Insights



Solar Home Systems (SHS)

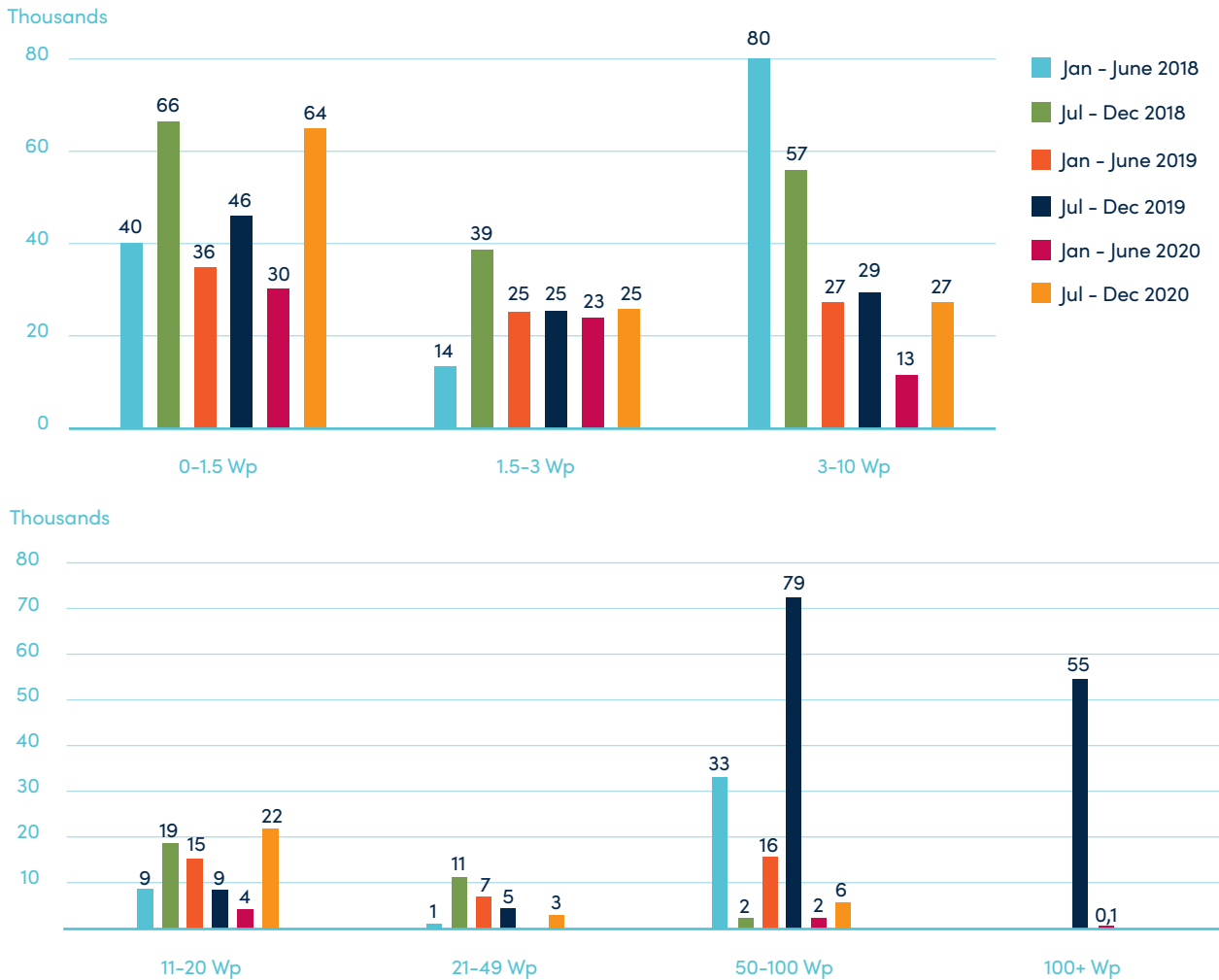
Almost all SHS segments are seeing large relative increases in East Asia & Pacific compared to the last reporting round, particularly in the 11-20 Wp and 50-100 Wp range. Affiliates reported 22,000 units sold in the 11-20 Wp category, a 397% increase compared to the first half of 2020 and a 145% increase compared to the second half of 2019.

In the last reporting round, not enough companies sold systems in the 21-49 Wp category to pass three-data point control, but this time companies

reported 2,700 units sold, which is still a decrease of 41% compared to the second half of 2019. In the 50-100 Wp segment, affiliates reported 6,100 units sold, a 234% increase compared to the first half of 2020, but still a 92% decrease compared to the second half of 2019.

Companies did report sales in the 100+ Wp category but these cannot be disclosed due to confidentiality rules.

Figure 83 - Semi-annual Evolution of Global Sales Volumes by Product Category - East Asia & Pacific



NOTE:

Lanterns 0-1.5 Wp include one light and no mobile charging, lanterns 1.5-3 Wp one light and mobile charging, and multi-light systems 3-10 Wp at least two lights and mobile charging. Solar Home Systems >11 Wp are classified based on panel wattage.

East Asia & Pacific Insights

Off-Grid Solar Appliances

Between July and December, the total recorded number of appliance sales in East Asia & Pacific reached 5,000 units sold. This is a 31% increase compared to the first half of 2020 and a 54% drop compared to the second half of 2019.

TVs represented 74% of the sales in the region with 3,583 units sold, followed by RUs sold 278 units, 6% of regional appliances sales. Sales volumes of fans and solar water pumps remained marginal and did not pass three-data point control.

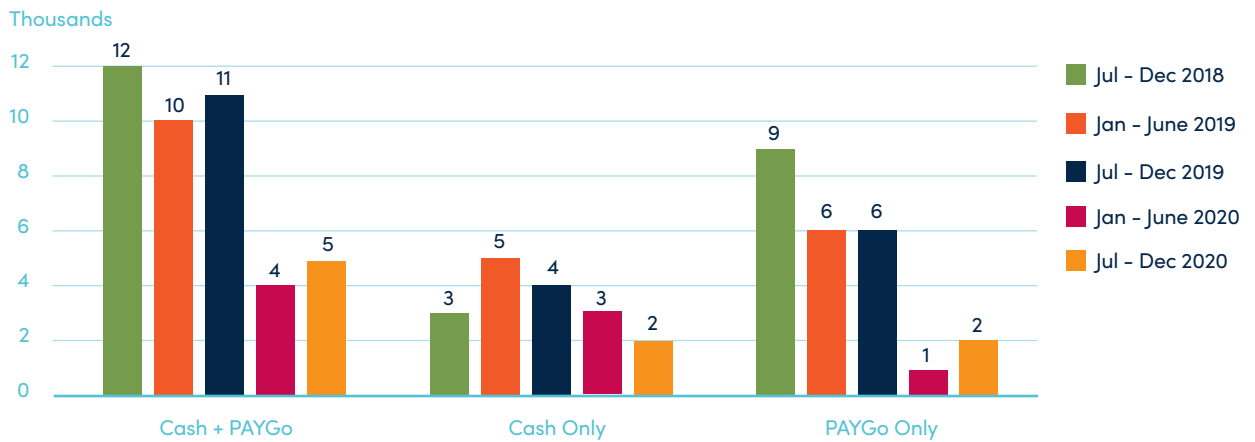


Fans

In the last reporting round, East Asia & Pacific was the third largest market for fans globally with over 2,000 units, after South Asia and West Africa.

This time, sales volumes cannot be included due to insufficient number of companies reporting. Figure 85 shows the evolution of fans sales over the last four reporting rounds.

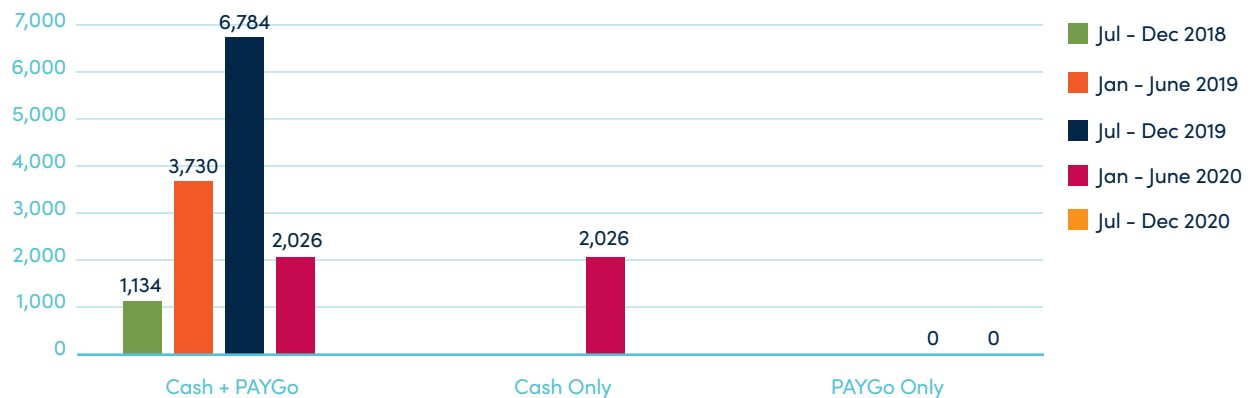
Figure 84 - Semi-annual Evolution for All Appliances - East Asia & Pacific



NOTE:

- The category 'All 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 instalments over time or pays for use of the product as a service.

Figure 85 - Semi-annual Evolution for Fans - East Asia & Pacific



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 instalments over time or pays for use of the product as a service.

East Asia & Pacific Insights



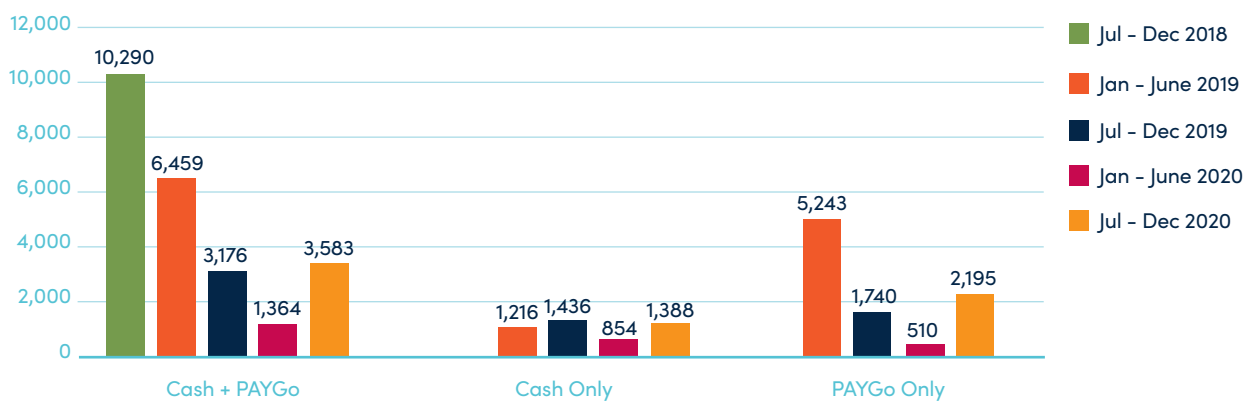
TVs

In East Asia & Pacific, 3,583 TVs were reported sold by affiliates in the second half of 2020. Sales showed a 163% decrease compared to the first half of 2020 and a 13% increase compared to the second half of 2019.

61% of TVs are sold via PAYGo (2195 units) as opposed to 39% (1388) units on a cash basis. Almost all units (91%) are sold bundled with a SHS.

In terms of the diversity of product categories, the extra-large TVs were sold the most, with 2,888 units sold. This is the highest number ever recorded for the product in the region. Sales for large and medium TVs experienced a downward trend with 193 and 502 units, respectively. No sales were recorded for small TVs.

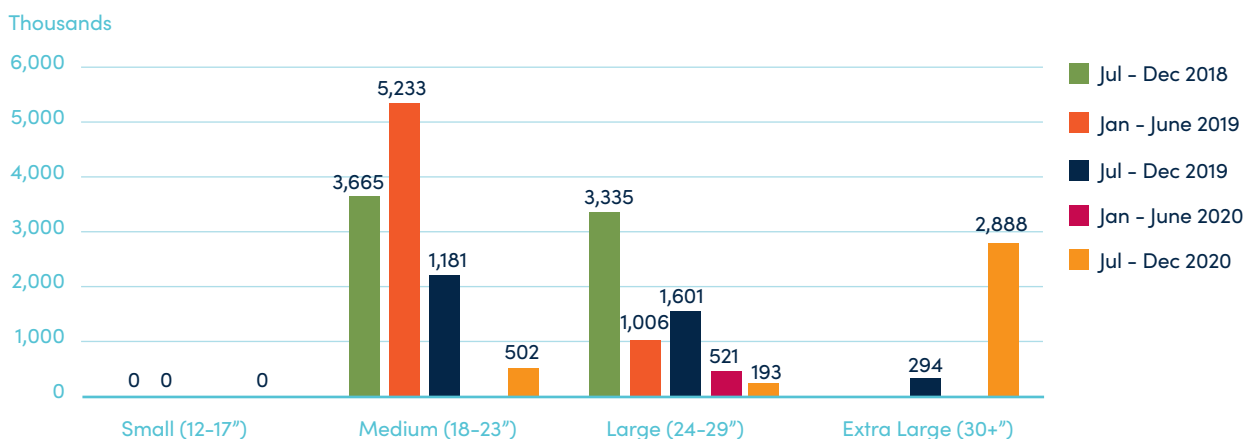
Figure 86 - Semi-annual Evolution for TVs - East Asia & Pacific



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 instalments over time or pays for use of the product as a service.

Figure 87 - Semi-annual Evolution of TVs by Product Category - East Asia & Pacific



East Asia & Pacific Insights



Refrigeration Units (RUs)

As in South Asia, the RUs volumes remain very low in East Asia & Pacific. Between July and December 2020, only 278 units were sold; no insights can be provided on the split between cash and PAYGo as less than three companies reported in one or both segments.

The majority of the total units (206 RUs) are reportedly sold bundled with a power system. Given the small volumes, the trends are highly influenced by variable sales, therefore no comment can be given yet on the trajectory of the region for this appliance type. Moreover, no split product category can be offered due to the confidentiality rule.



Solar Water Pumps (SWPs)

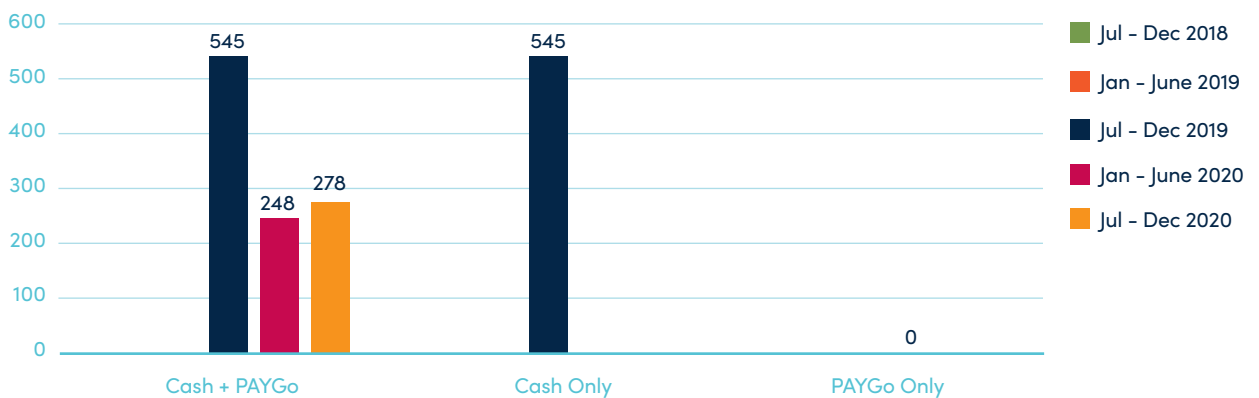
In East Asia & Pacific, sales of SWPs do not pass the confidentiality rule but do report sales. Note that this was also the case in the last reporting round.

Other Appliances

In East Asia & Pacific, no sales of other appliances were reported. This appliance type normally includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Currently, if separated, these volumes would not pass our confidentiality rules. For the time being, they will be reported together, while their progress is monitored.

Radios are excluded from both 'All Appliances' and 'Other Appliances', as they are regularly sold bundled with lighting systems and their large volumes would bias the overall results. **Over 900 radios were sold in East Asia & Pacific in the second half of 2020.**⁵⁶

Figure 88 - Semi-annual Evolution for RUs - East Asia & Pacific



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 instalments over time or pays for use of the product as a service.

⁵⁶ Radios are primarily sold bundled with a power system in sub-Saharan Africa. While the total sales number in East Asia is 0, they are reported separately for consistency.

East Asia & Pacific Insights



Myanmar Insights

Background

The Government of Myanmar implemented a range of containment measures in response to the COVID-19 pandemic early in the year such as travel restrictions, closure of borders, and bans on mass public gatherings. **It was not until August that infections increased, forcing the country into regional lockdowns.**

Even though the economy has been deeply affected by the outbreak, with sharp declines in tourist arrivals, supply chain disruptions for the garment sector, and losses for SMEs, which have resulted in large layoffs and factory closures, the economy still grew with 1.7% in 2020.

Off-grid solar companies were heavily affected due to eroding consumer confidence and the restrictions, but growing investor confidence and a government backed result-based financing (RBF) program are encouraging signals for a resilient private sector. **The RBF program, worth US\$ 3.45 million and co-funded by Global Partnership for Results-Based Approaches (GPRBA) and the World Bank, funds off-grid solar companies to develop supply chains for quality verified solar products, with the aim to provide off-grid solar solutions to 450,000 people.**⁵⁷

Sales Trends

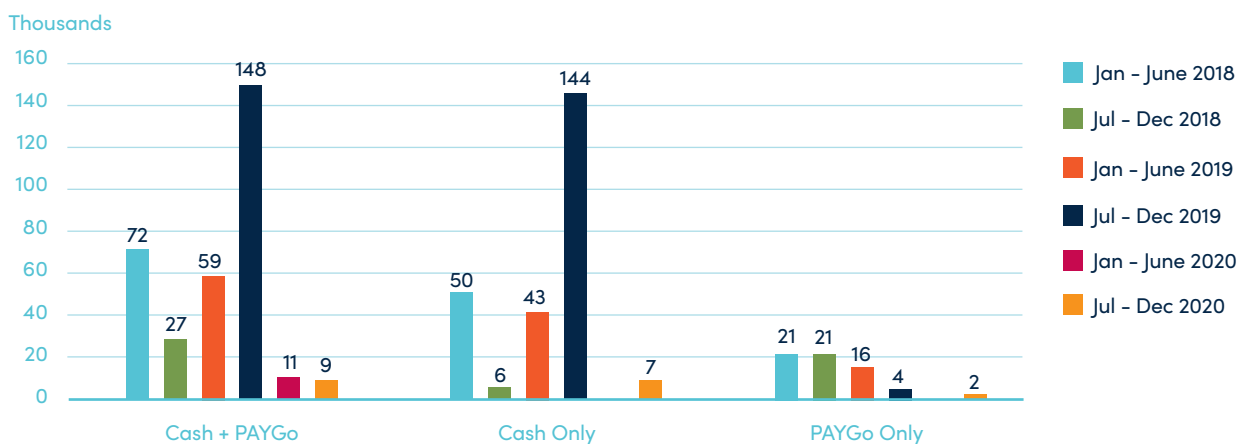
Off-Grid Solar Lighting

Sales of off-grid solar products in Myanmar were around 9,000 units between July and December 2020. These volumes are slightly lower than the previous reporting round, but significantly lower than the volumes recorded in the second half of 2019. Note that the spike reported in the second half of 2019 was due to government tenders for SHS of 50+ Wp.

Off-Grid Solar Appliances

Between January and June 2020, the total recorded number of appliance sales in Myanmar did not pass three-data point control. Therefore, there are no visible market trends in the country.

Figure 89 - Semi-annual Evolution of Volume of Lighting Products Sold - Myanmar



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 instalments over time or pays for use of the product as a service.

East Asia & Pacific Insights



Papua New Guinea (PNG) Insights

Background

In PNG, the government took containment measures early in the COVID-19 pandemic. The parliament voted to shut down the country in April for two months, and eased restrictions from July onwards. International travel reopened in October.

Due to the crisis, the economy contracted around 3% in 2020, but is expected to grow again in 2021 by 2.5%. Off-grid solar companies were particularly affected by supply chain disruptions and logistical challenges.

On a positive note, the Australian Department of Foreign Affairs and Trade (DFAT) launched the 'Pawarim Komuniti', a grant program aiming to

incentivize innovative off-grid projects in remote parts of Papua New Guinea.⁵⁸ The first call for proposals closed in early 2020, while a second call of proposals was closed in July, and a third call is planned for 2021. This program supports access to off-grid solar products in underserved or unserved communities in PNG and increased sales in the second half of the year.

Another program was announced in November 2020. **The PNG Electrification Partnership (PEP), led by USAID, will run for five years with a total budget of US\$ 57 million, and aims to electrify 200,000 households in PNG.** One of the goals of the program is to develop at least ten viable off-grid electrification models in select remote communities.



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58. For more information, please see the [Pawarim Komuniti, Papua New Guinea Off-Grid Electrification Program](#).

East Asia & Pacific Insights



Papua New Guinea (PNG) Insights

Sales Trends

Off-Grid Solar Lighting

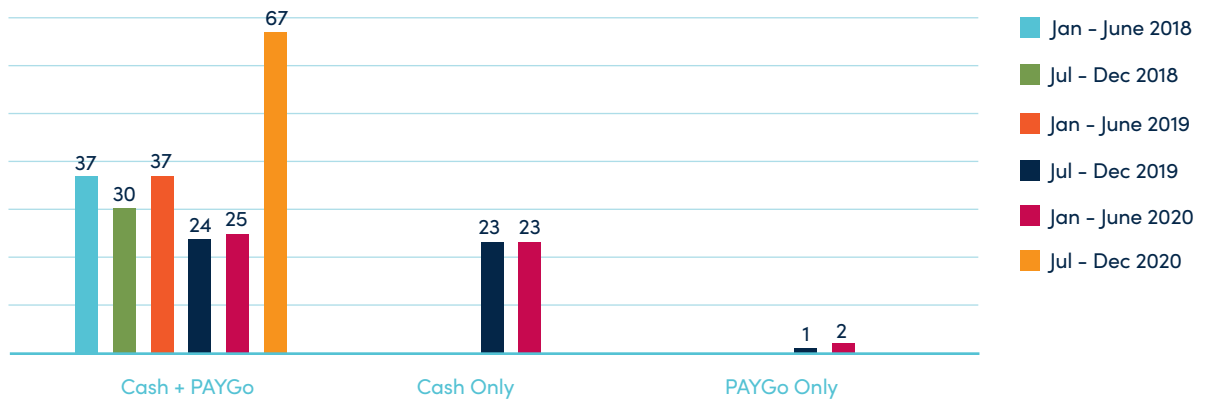
Sales of off-grid solar products in PNG totaled **67,000 units between July and December 2020**. This is the highest number ever recorded, representing around a 175% increase compared to both the first half of 2020 and the second half of 2019. Companies anecdotally shared that the sales boost can be linked to bulk procurement sales through the government and the supporting programs mentioned above. It is not possible to include the split between cash and PAYGo sales due to the three-data point rule.

Off-Grid Solar Appliances

Between July and December 2020, the total recorded number of appliance sales in PNG were **1,737 units**. This is a 289% increase compared to the first half of 2020 and a 6% increase compared to the second half of 2019. No split in appliance types can be offered for the volumes of this reporting period due to the low number of companies not satisfying the three-data point rule.

Figure 90 - Semi-annual Evolution of Volume of Lighting Products Sold - Papua New Guinea

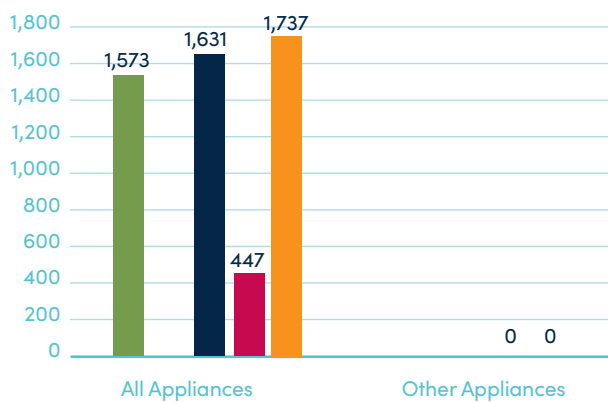
Thousands



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 instalments over time or pays for use of the product as a service.

Figure 91 - Semi-annual Evolution for Appliances Products - Papua New Guinea



NOTE:

- The category 'All Appliances' refers to the sum of all TVs, fans, solar water pumps and refrigeration units. The Category 'Other Appliances' includes products such as agro-processing machines, air-conditioners, irons, hair clippers, stereo, sewing machines, egg incubators and other machinery. Note that radios are excluded from the count of 'Other Appliances'.
- Only the appliance types that passed three-data point control any of the rounds are included in the figure.

■ Jul - Dec 2018 ■ Jul - Dec 2019 ■ Jul - Dec 2020
■ Jan - June 2019 ■ Jan - June 2020



Methodology



Methodology of Sales Data Collection

Scope

Eligible Products

The off-grid solar sector has brought access to light and modern energy into homes for over a decade and became a key part of electrification strategies around the world. In addition to the essential lighting access, off-grid solar now powers a growing selection of appliances. **To accurately reflect this, the report presents sales data for two separate product segments** using the same methodology.

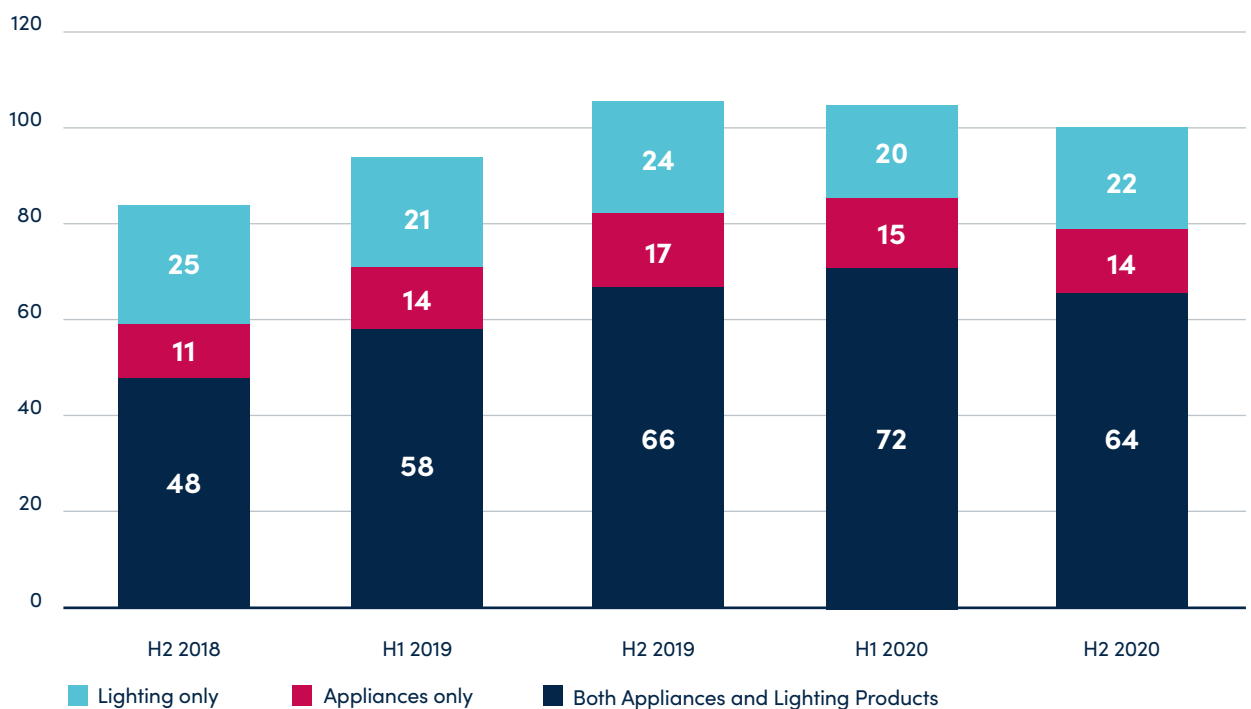
- 1. Off-Grid Solar Lighting Products:** Systems that include a solar panel, a battery and at least one light point. Products which are sold as components such as individual panels, lights, batteries, or mobile phone chargers are not included.
- 2. Off-Grid Solar Appliances:** A range of energy-efficient electrical appliances appropriate for both off-grid or weak-grid areas.⁵⁹ These devices are typically DC-powered and usually more energy efficient than traditional counterparts. This report focuses on TVs, fans, refrigeration units, and solar water pumps. Scope is further narrowed to those appliances most suitable for purchase by individual customers on a household or micro-

enterprise level. In the case of solar water pumps, this means they must be less than 3 kW and solar-powered, while for refrigeration, large commercial scale walk-in units are not considered. Besides these four appliance types, sales are also gathered for other solar-powered appliances which include hair cutters, irons, agro-processing machines, air conditioners, stereos and others. Radios are currently excluded.

Eligible 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 Lighting Global Quality Standards, and appliance companies that participated in the Global LEAP Awards or are engaging with the Low Energy Inclusive Appliances (LEIA) program. **Out of a pool of 237 eligible companies, 100 participated in this round and reported sales covering the period July - December 2020.** A breakdown is offered in Figure 92. The full list of participating companies can be seen in Table 5.

Figure 92 - Breakdown of Companies per Segment



⁵⁹ 'Off-grid' refers to populations that live beyond the reach of the national grid; 'weak-grid' refers to populations that have unreliable grid connectivity and suffer frequent and sometimes lengthy outages.

Methodology of Sales Data Collection

Table 5 - List of Participants Reporting Sales

#	Company Name	Off-Grid Solar Lighting	Off-Grid Solar Appliances	#	Company Name	Off-Grid Solar Lighting	Off-Grid Solar Appliances
1	A4&T Power Solutions Limited	DIS	-	53	Pawame		DIS
2	Agsol	-	MAN	54	PEG Africa	DIS	MAN & DIS
3	Al Qaria Solar	DIS	-	55	Plug The Sun	MAN	DIS
4	ALTECH GROUP SARL		DIS	56	Poly Solar Technologies		MAN
5	ARESS Group	DIS	MAN & DIS	57	Powerband Green Energy	MAN	DIS
6	Azimuth Solar	DIS	DIS	58	Power Trust Uganda	DIS	MAN & DIS
7	Azuri		MAN	59	Qingdao LEFF International Trading		MAN
8	Baobab+		DIS	60	Qotto		MAN
9	Barefoot Power		MAN	61	RDG Collective		MAN
10	BBOXX		MAN	62	Sandi Solar	MAN	-
11	Beebeejump		MAN	63	Shenzhen JCN New Energy Technology	MAN	-
12	Bengal Renewable Energy		MAN	64	Shenzhen LEMI Technology Development	MAN	MAN & DIS
13	BioLite	MAN	-	65	Shenzhen Power Solutions	MAN	-
14	Bonergie	DIS	MAN & DIS	66	Shenzhen Solar Run	MAN	-
15	Bright Life by Finca	DIS	-	67	Shenzhen Sun's Energy	MAN	-
16	Bright Products AS	MAN	-	68	Signify	MAN	-
17	CECEP	MAN	-	69	Simusolar	-	MAN & DIS
18	CYONI	MAN	MAN & DIS	70	Sinoware Technology	MAN	-
19	d.light		MAN	71	Smarter Grid International		MAN
20	Deevabits Green Energy	DIS	MAN	72	Solar Idea	MAN	DIS
21	Devidayal Solar Solutions		MAN	73	Solar Sister	DIS	MAN & DIS
22	DGridEnergy	-	MAN	74	Solar Village	MAN	MAN & DIS
23	Dulas	-	MAN	75	SolarHome		DIS
24	EcoEnergy	DIS	MAN	76	Solar Panda		MAN
25	Ennos AG	-	MAN	77	SolarWorks!	DIS	MAN & DIS
26	Fenix International		MAN	78	Solibrum Solar	DIS	MAN & DIS
27	Fosera		MAN	79	Sosai Renewable Energies	DIS	MAN & DIS
28	Futura Sun	MAN	-	80	SUNami Solar		MAN
29	Futurepump	-	MAN	81	SunCulture		MAN
30	GLOBAL ICE TEC	-	MAN	82	SunDanzer	-	MAN
31	Greenlight Planet	MAN	MAN & DIS	83	SUNKEN	DIS	MAN
32	Innovation Africa	-	MAN	84	Sunna Moon	MAN	-
33	Jua Energy		MAN	85	Sunny Money (Solar Aid)	DIS	-
34	Koolboks	-	MAN	86	SunTransfer Kenya		MAN
35	Kumusha Power		DIS	87	Super Star Renewable Energy (SSG Solar)		MAN
36	Lagazel	MAN	-	88	Tamoor Fan Company	-	MAN
37	Little Sun	MAN	-	89	Total	MAN & DIS	DIS
38	Lumos Global	MAN	-	90	UltraTec	DIS	DIS
39	Mango Energy	MAN	-	91	UpOwa	DIS	-
40	Micergy		MAN	92	Village Boom	MAN	-
41	M-KOPA		MAN	93	Village Power	MAN	DIS
42	Mobisol		MAN	94	Vitalite Zambia		DIS
43	M-PAYG	MAN	DIS	95	Vitalite Senegal		DIS
44	Mwezi Limited		DIS	96	Wala	-	DIS
45	Nadji-Bi		MAN	97	Youmma Solar	-	MAN
46	Namene Solar Light	MAN	-	98	Zola Electric (former Off-Grid Electric)		MAN
47	National Solar Power Authority (NASPA)		DIS	99	Zonful Energy	DIS	MAN & DIS
48	Niwa		MAN	100	Zuwa Energy		DIS
49	OmniVoltaic Energy Solutions		MAN				
50	Oolu Solar	DIS	MAN				
51	OVO Solar Technologies	-	MAN				
52	OvSolar		MAN				

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. In some cases, companies are classified as both manufacturer and distributor, as companies sell both their own branded products, while also distributing other companies' products.

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 estimated. This is partly due to insufficient data on the total size and number of players in this market. Continuous efforts are made to estimate such coverage as well as ongoing efforts to engage a larger number of companies in upcoming rounds.

For Off-Grid Solar Lighting Products, 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%, as non-affiliate products are particularly dominant in those two pico segments. It is estimated that 72% of the overall global market consists of sales from approximately 200 non-affiliate manufacturers. These market share percentages vary dramatically from country to country, as demonstrated in Table 6.

Table 6 – Market Share Estimates of Affiliate and Non-affiliates Manufactures for both Pico & SHS⁶⁰

Country	Affiliates	Non-affiliates
Global	28%	72%
Rwanda	97%	3%
Zambia	68%	32%
Kenya	54%	46%
Cambodia	47%	53%
Nigeria	33%	67%
Ethiopia	29%	71%
India	25%	75%
Uganda	22%	78%
Niger	14%	86%
Togo	7%	93%
Myanmar	5%	95%

NOTE:

The global market share is calculated using a weighted average of non-affiliate market share for 12 countries.

Countries and Regions

The regional groupings in this report follow those outlined by the World Bank country and lending groups.⁶¹ Sub-regional groupings in sub-Saharan Africa follow the United Nations' categorization of geographical sub-regions.⁶²

Sales data is represented in this report for all countries in which at least three companies reported sales. For off-grid solar lighting products, this amounted to 32 countries while, for off-grid solar appliances, 28 country market sales are reported for all appliances combined. The amount of country breakdowns differs between appliance types with 12 countries passing three-data point control for TVs, 9 for refrigeration units, 8 for fans and 3 for solar water pumps.

Data Collection

Partner Organisations

In line with previous reports, data collection and affiliate reporting were overseen by Berenschot, a Dutch management consultancy firm. Specialized industry knowledge and insight was provided by a research team, consisting of GOGLA, Lighting Global, Energy Saving Trust, and CLASP. The online questionnaire and results platform were programmed by Outfox, a Dutch web development company.

Data Collection Process

This data collection process takes place semi-annually, collecting sales information for the January - June period and the July - December months of a given year. Affiliates are requested to provide their product and country-level sales through an online questionnaire in a three-week period every January and July. Great effort is made to ensure maximum participation, with GOGLA offering one-on-one support to companies throughout the reporting process. The data is then monitored for accuracy, aggregated with strict confidentiality rules, and analyzed to compile the Global Off-Grid Solar Market Report.

Results Visualization

Each participating company receives access to a recently enhanced and improved online platform

60 Lighting Global, Vivid Economics and Open Capital Advisors (2020), 2020 Global Off-Grid Solar Market Trends Report.

61 World Bank, World Bank Country and Lending Groups.

62 United Nations Statistics Division, Standard Country or Area Codes for Statistical Use (M49).

Methodology of Sales Data Collection

that provides each company with a dashboard to view and download the consolidated sales figures for all affiliates and their own performance since 2016. The interactive platform illustrates the market share in all geographies and product segments for which they have reported sales.

Accuracy

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. It is also important to note that companies may choose to report sales volumes but not pricing information used to estimate the market value of such products.

Data Checks

The research team monitored the reported data for consistency and logic with respect to previous data records. Based on these checks, some small adjustments have been made concerning product performance specifications and the 'quality verified' status of products where necessary. Companies were contacted, prior to publication, in any instances where changes to their data were required.

Data Aggregation and Segmentation

Definition of Manufacturers/Distributors to Avoid Double-counting Sales

Companies are classified as either distributors of other companies' branded products, or as manufacturers if they are selling their own-brand products. In some cases, companies are classified as both manufacturer and distributor, as companies sell both their own branded products, while also distributing other companies' products (please see Table 5).

Only sales data from companies categorized as manufacturers is presented in this report to avoid double counting.

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'.

Distinction between Cash and PAYGo Sales Sales are split into two categories based on whether the products are sold to a customer:

- a. As a **cash sale**, in a single transaction to the customer. Note that this category also typically includes products purchased as a tender by governments and humanitarian agencies.
- b. On a **Pay-As-You-Go (PAYGo) basis**, where the customer pays for the product in instalments 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.

Following the confidentiality rule, the split in sales volumes is shown for any single data point where at least three separate manufacturers have reported data for both cash and PAYGo products. Otherwise, when only one of the two payment categories passes this confidentiality rule, only the combined total is shown.

Computations

For both off-grid solar appliances and lighting products, the **sales volumes (in units)** are given by the sum of all the products sold by companies classified as manufacturers (products sold by distributors are not included to avoid double-counting as noted above).

Only for the off-grid solar lighting products, the report presents the **newly installed capacity (in MW)**; this represents the total peak power output of solar panels deployed during this reporting round. This metric provides further insight and enables calculation of the average size of systems sold in a region or country.

Another indicator presented in this report is the **market value of the products (in USD)**, currently reported only for off-grid solar lighting products. In

Methodology of Sales Data Collection

future rounds of data collection, the research team will evaluate the best methodology to measure the market value of off-grid solar appliances.

Given the difference in the nature of cash and PAYGo segments, two different proxies are used to compute their market value; therefore, the total value of all the products sold in each round cannot be calculated by combining the two values reported.

a. **The value of cash products** is determined by multiplying the sales volume by a wholesale per unit price reported by the product manufacturer and a multiplying factor to estimate the costs incurred in getting the product to customers. This includes transport, duties, taxes, clearance costs, sales channel overhead, and markups. The **wholesale Free-on-board (FOB) price** is defined as the United States dollar (USD) per unit price for a 1,000-unit minimum order quantity, at the point of supply.

b. Using the FOB price as a proxy for the value of PAYGo products would not be accurate because the time frame of payment is projected to the future in line with the business model, allowing customers to pay for their products over several months or years. **The value of PAYGo products sold** is calculated here by multiplying the sales volumes by the **Estimated Total Cost of Ownership (TCO)** in USD reported by the PAYGo company and applying a standard estimated loss rate to account for cases where customers do not pay back for the product in full (e.g. products lost or destroyed or customer default). 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.

Methodology of Sales Data Collection

Product Categorisation

Off-Grid Solar Lighting Products




This segment consists of systems that include a solar panel, a battery and at least one light source. This means that products sold as components such as individual panels, lights, batteries or mobile phone chargers, are not included.

Data has been grouped into product categories to present sales in a segmented manner that provides the most value and information to the market. **The categories of all products with less than 11 Wp solar module capacity are determined by the services provided by the product in question.** An example of this would be the number of light points and the possibility of mobile charging. Each

of these categories is represented by an indicative wattage range of PV modules that is typical for most products providing these services. **Panel wattage in watt-peak (Wp) is used to categorize off-grid solar lighting products with solar modules of 11 Wp and above.** The definitions of these categories are presented in Table 7.

The level of energy access these off-grid solar lighting products provide is shown using the multi-tier framework for measuring energy access. This framework was developed by the World Bank's Energy Sector Management Assistance Program (ESMAP)⁶³ under the Sustainable Energy for All initiative.

Table 7 – Product Categories – Off-Grid Solar Lighting Products

Overall category	Solar module capacity, Watt Peak (Wp)	Categorization by services provided by product	Corresponding level of Multi-Tier Framework energy access enabled by use of product
 Portable Lanterns	0 – 1.499 Wp (indicative)	Single Light only	Enables partial Tier 1 Electricity Access to an individual person
	1.5 – 2.999 Wp (indicative)	Single Light & Mobile Charging	Enables full Tier 1 Electricity Access to at least one person and contributes to a full household
 Multi-light Systems	3 – 10.999 Wp (indicative)	Multiple Light & Mobile Charging	Enables full Tier 1 Electricity Access to at least one person up to a full household
 Solar Home Systems	11 – 20.999 Wp	SHS, Entry Level (3-4 lights, phone charging, powering radio, fan etc.)	Enables full Tier 1 Electricity Access to a household
	21 – 49.999 Wp	SHS, Basic capacity (as above plus power for TV, additional lights, appliances & extended capacity)	Enables full Tier 2 Electricity Access to a household when coupled with high-efficiency appliances
	50 – 99.999 Wp	SHS, Medium capacity (as above but with extended capacities)	Enables full Tier 2 Electricity Access to a household even using conventional appliances
	100 Wp +	SHS, Higher capacity (as above but with extended capacities)	

Methodology of Sales Data Collection

Off-Grid Solar Appliances

This report features a range of off-grid solar appliances; TVs, fans, refrigeration units and solar water pumps, sold to targeted customers living in off-grid or weak-grid areas. At this early stage of data collection for appliances, just a small subset of all available appliances is considered, as only solar-powered appliances are accounted for. Our scope is further narrowed to focus on appliances most suitable for purchase by individual customers on a household or micro-enterprise level. In the case of solar water pumps, they must be less than 3 kW and solar-powered, while for refrigeration, large commercial scale walk-in units are not considered.

Companies and sector experts assessed how best to categorize and present the findings in this report to offer the greatest possible clarity for each appliance type and their sub-categories. The Global LEAP Awards' categorization for refrigerators and solar water pumps was adopted, as it was designed to recognize high standards of technical performance, energy efficiency, and innovation specifically for off-grid appropriate

appliances. Using this product categorization means the data in this report is presented as clearly and consistently as possible. In future rounds, there may be a review of the solar water pumps categorization and the terminology of the refrigeration units' section, due to the continued growth and evolution in these appliance areas.





Two of four appliance types were segmented not only by their size (e.g. the diameter in inches for the fans), but also by the type of products (e.g. table fans vs. ceiling fans). **The categorization below in Table 8 was adopted as a way of future-proofing** and we accept that for now, most of these single categories will not be shown, as the three-data point rule hides all data points where less than three responses have been collected.

Currently, the other appliances are not being segmented, because, if separated, these volumes would not pass our confidentiality rules. Therefore, for the time being we are going to keep reporting them bundled together while monitoring progress of each appliance type.



Methodology of Sales Data Collection

Table 8 – Product Categories – Off-Grid Solar Appliances

Appliance Type	Categorization (in blue) and definition (in blue bold)	
	TVs Screen Size (diagonal, inches)	
	Small 12-17"	
	Medium 18-23"	
	Large 24-29"	
	Extra Large 30+"	
	Fans Diameter (inches)	
	Table Fan A smaller-diameter propeller-bladed fan having two or more blades and intended for use with free inlet and outlet of air. It may be a table fan or bracket-mounted fan for wall or ceiling mounting.	
	Small <12"	
	Large 12+"	
	Pedestal Fan A propeller-bladed fan having two or more blades mounted on a pedestal of fixed or variable height and intended for use with free inlet and outlet of air.	
	Ceiling Fan A propeller-bladed fan having two or more blades and provided with a device for suspension from the ceiling of a room so that the blades rotate in a horizontal plane.	
	Small <48"	
	Large 48+"	
		Refrigeration Units Size (liters)
		Refrigerator One or more fresh food compartments for the storage and preservation of unfrozen food and beverages.
Small 5-50 L		
Medium 51-100 L		
Large 101+ L		
Refrigerator-Freezer Combination Unit At least one fresh food compartment and at least one freezer compartment		
Small 5-100 L		
Medium 101-150 L		
Large 151-200+ L		
Extra Large 201+ L		
Multi-temperature Refrigerator One or more compartments that can be operated either as a refrigerator or freezer by adjusting the thermostat control.		
Freezer At least one freezer compartment for storage and preservation of frozed food and beverages		
	Solar Water Pumps No breakdown was possible due to limited variety of data reported	
	Other Appliances No breakdown was possible due to limited variety of data reported	

Methodology of Impact Metrics Estimation

Impact for lighting products is calculated using the Standardised Impact Metrics for the Off-Grid Solar Energy Sector. These metrics were first launched in 2015 and revised in April 2020. Impact for appliances products is calculated using the Standardised Impact Metrics for High-Performing Appliances: Fans and TVs. These metrics were first launched in 2020, and currently cover fans and TVs only. Metrics for solar water pumps are currently being developed.⁶⁴

The metrics are a framework for the off-grid solar sector to collectively estimate social, economic and environmental impact in a consistent and comparable way. **They help build the evidence base for the many benefits that off-grid solar products and services unlock for people previously living in energy poverty.** These include unlocking financial savings, generating additional income, and using the light hours to work, study or spend time with family.

Methodology

Each impact metric in this report combines relevant company data, such as sales and product characteristics, with coefficients and default values. The default values of the coefficients have been developed by the GOGLA Impact Working Group, a body of industry practitioners and academic observers. They incorporate findings from publicly available research, data made available by participating companies, and by the application of informed assumptions and calculations. The metrics have been reviewed by external experts and are aligned with the IRIS impact metrics (lighting only).⁶⁵

The impact estimates for this reporting round were calculated by applying these standardized impact metrics to the off-grid solar lighting and appliance product sales reported by affiliates.

The impact of sales between July and December 2020, as well as all sales of off-grid solar lighting products reported by participating companies in previous reports since July 2010, and the sales of off-grid appliance products since July 2020, are included in these calculations.

Affiliates include GOGLA members, companies selling products that meet Lighting Global Quality Standards, and appliance companies that participated in the Global LEAP Awards or are engaging with the Low Energy Inclusive Appliances (LEIA) program. To avoid double-counting, the results are only drawn from data provided by manufacturers.

Limitations

This report estimates the impact made by participating companies. **Therefore, while the numbers shown represent the aggregate impact of key players in the off-grid solar sector, this report does not present an estimate of the overall global impact of off-grid solar lighting products sold outside the scope of this report for this reporting period.**

This report takes a conservative approach to data inclusion and may underestimate the total impact of participating companies. For example, to estimate when a product reaches its end of life, 1.5x its warranty period is used. This means that no impact is attributed to a product after that time. However, it is possible that a significant number of these products are continuing to benefit households beyond this estimated period. In addition, if companies have not provided all the product specifications needed for a particular impact metric, such as lumen output or runtime, the product is not included in the analysis for that metric.

Please note that the current approach is based on best available research information and data. All metrics used to create the impact numbers in this paper, as well as the default values and definitions including the methodology and sources, can be found in the GOGLA Standardised Impact Metrics for the Off-Grid Solar Energy Sector.⁶⁶ **Note that all numbers calculated using the metrics should be expressed as estimates.**

64 GOGLA (2020), Standardised Impact Metrics for the Off-Grid Solar Energy Sector, Version 4.0 and GOGLA (2020), Standardised Impact Metrics for High-Performing Appliances: Fans and TVs, Version 1.

65 For more information, please visit The Global Impact Investing Network Impact Toolkit.

66 GOGLA (2020), Standardised Impact Metrics for the Off-Grid Solar Energy Sector, Version 4.0 and GOGLA (2020), Standardised Impact Metrics for High-Performing Appliances: Fans and TVs, Version 1.

Methodology of Impact Metrics Estimation

List of Impact Metrics

Table 9 and 10 provide an overview of all the metrics for which the estimated results are presented in this report.

Table 9 – List of Impact Metrics for Lighting Products

1ai.	Number of people with improved energy access, cumulatively Cumulative number of people who have ever lived in a household with improved energy access (as a result of access to off-grid solar)
1aii.	Number of people with improved energy access, currently Number of people who currently live in a household with improved energy access (as a result of access to off-grid solar)
1bi.	Number of people with access to Tier 1 energy services Number of people who currently access Tier 1 energy services, based on the Sustainable Energy for All Global Tracking Framework (as a result of access to off-grid solar)
1bii.	Number of people with access to Tier 2 energy services Number of people who currently access Tier 2 energy services, based on the Sustainable Energy for All Global Tracking Framework (as a result of access to off-grid solar)
2a.	Number of people undertaking more economic activity Number of people who are currently undertaking more economic activity as a result of using off-grid solar
2b.	Number of people using products to support enterprise Number of customers using their system to support an enterprise or income generating activities e.g. charging phones for a fee or operating a bar, restaurant or shop/stall at night
2c.	Number of people that spend more time working Number of customers spending more time working as a result of using off-grid solar e.g. as a household member can shift tasks to the evening time as a result of increased light hours or as they spend less time travelling to buy fuel – unlocking time for work
3b.	Additional income generated, cumulatively Cumulative amount of additional income generated as a result of off-grid system ownership; generated over the expected lifetime of the solar products
4.	Kerosene lanterns replaced Number of kerosene lanterns no longer in use because users have replaced them with solar lighting
5.	CO₂e emissions avoided Metric tons of CO ₂ and black carbon averted due to reduction in kerosene use (in CO ₂ e) over expected lifetime of all solar products
6ai.	Additional light hours used, by household Average additional hours of light usage, per household; over the expected lifetime of their solar product
6aii.	Additional light hours used, cumulatively Cumulative number of additional light hours used by all households; over the expected lifetime of their solar products
6b.	Change in quality of light, by household Change in lumens of light used, per household (on average)
7ai.	Savings on energy expenditure, by household (solar lanterns and multi-light systems <11Wp only) Amount of US\$ savings on energy-related expenditure, per household; over expected lifetime of solar product
7aii.	Savings on energy expenditure, cumulatively (solar lanterns and multi-light systems <11Wp only) Amount of US\$ savings on energy-related expenditure, in aggregate of all sales ever; over the expected lifetime of products

NOTE:

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

Methodology of Impact Metrics Estimation

Table 10 - List of Impact Metrics for Appliances Products

1a.	Number of people benefitting from high-performing appliances, cumulatively Cumulative number of people who have ever lived in a house with a high-performing [insert type of] appliance
1b.	Number of people benefitting from high-performing appliances, currently Number of people who currently live in a house with a high-performing [insert type of] appliance
2a.	Number of people using high-performing appliances to support enterprise Number of people who are using their high-performing appliance to support an enterprise, or income generating activities (e.g. showing TV for a fee, or using their fan to improve the temperature within an office or shop to improve working conditions / attract customers)
2b.	Number of people generating additional income Number of people that are generating additional income as a result of using their highperforming appliance (for example to open a business or to charge a fee for use of the appliance)
3a.	Metric tons of CO2e emissions avoided from diesel displacement Metric tons of CO2e averted due to estimated reduction in diesel generator emissions of CO2, CH4 and N2O, per off-grid high-performing appliance; over expected lifetime of the product

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