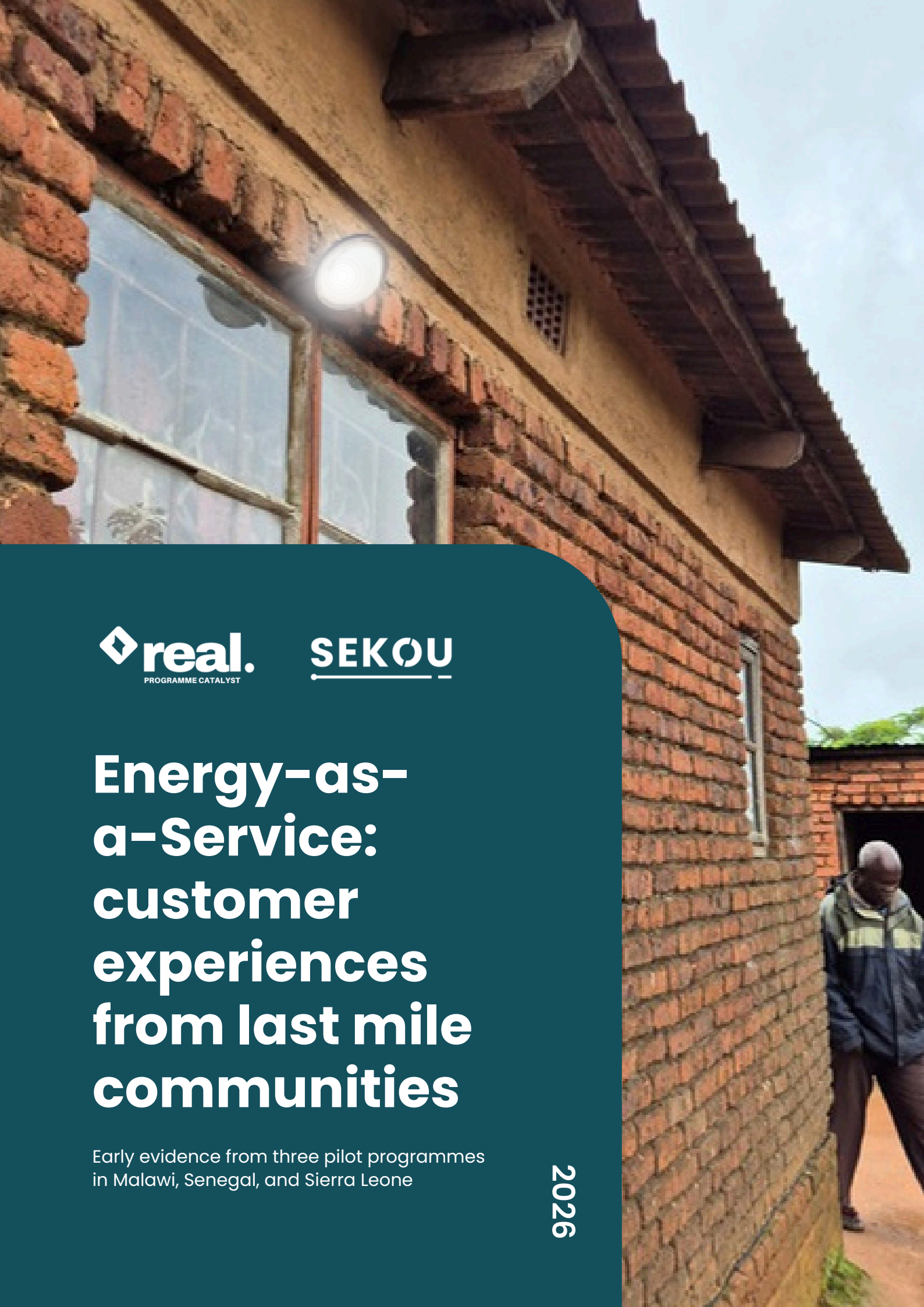

real. PROGRAMME CATALYST

SEKOU

Energy-as-a-Service: customer experiences from last mile communities

Early evidence from three pilot programmes in Malawi, Senegal, and Sierra Leone

2026

AUTHORS

SÉKOU

SÉKOU is a consulting firm specialising in the management of complex projects in sub-Saharan Africa. The team supports development actors in maximising the impact of their programmes, drawing on collaborative methodologies, local partnerships and iterative processes. Their approach emphasises accountability to communities and the production of accessible and directly usable content, to ensure that studies do not remain on the shelf.

More information on: www.sekou.org

REAL Programme Catalyst

REAL Programme Catalyst is a not-for-profit programme developer, partnering with governments and funders across sub-Saharan Africa in designing, funding, and implementing large-scale, sustainable energy access programmes for the hardest to reach. REAL's approach delivers an affordable, quality long-term service, ensuring that once households gain access to energy, they stay connected.

More information on: www.realenergyaccesslab.org

Author and assessment coordinator:

Axel Boeykens, Sustainable Development Consultant, founder of SÉKOU.

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Disclaimer

This report is based on self-reported data collected from 596 customers using Energy as-a-Service systems across Malawi, Senegal, and Sierra Leone. The findings reflect customers' perspectives at a specific point in time, approximately four months after installation, and should be interpreted within this context.

The study does not include a baseline or control group and is not designed to establish causal relationships between the service and reported outcomes. Reported changes are based on customer recall and may be subject to recall bias. Responses may be influenced by social desirability bias where respondents tend to provide more positive answers.

Overall, the findings should be understood as customer-reported experiences that provide useful directional insights. Further investigation would be needed to validate and deepen these observations. While this report is not intended to meet the standards of an academic paper, the findings presented provide useful operational signals for improving service quality, payment experience and continuity of use.

This work was funded by the Nordic Development Fund, Good Energies Foundation, the DOEN Foundation and British International Investment. The opinions expressed in this document do not necessarily reflect those of the pilots' funders.

Contact : info@realenergyaccesslab.org

1. EXECUTIVE SUMMARY

In rural sub-Saharan Africa, around 600 million people still live without access to energy.[1] This negatively impacts health, education and economic prospects at individual, community and national levels.

Lack of energy access is rooted in affordability challenges, compounded by the remoteness of the hardest-to-reach communities, lack of infrastructure, and high cost of deployment. REAL Programme Catalyst (REAL) believes that their energy access model can overcome these challenges.

REAL Programme Catalyst is a not-for-profit programme developer, partnering with governments and funders to fast-track the adoption of scalable, affordable and sustainable solar home systems (SHS) through Energy-as-a-Service (EaaS) programmes in rural sub-Saharan Africa. Their goal is to deploy solar home systems at scale in the hardest-to-reach communities, and ensure a reliable and sustainable first energy service. Taking an infrastructure mindset, REAL aims to demonstrate how applying the EaaS model to solar home systems can connect the largest number of remote populations to long-term, foundational energy access in line with SDG7 objectives.

This report presents an independent review of the first survey of REAL Programme Catalyst's EaaS pilots in Senegal, Malawi and Sierra Leone, an assessment of "leave no one behind" targeting, and the value of the service delivered.

These findings are drawn from customer surveys conducted among 596 households using solar home systems-as-a-service across the three pilot countries: Senegal (n=129), Sierra Leone (n=201), and Malawi (n=266). The survey captures how customers report their experience with the service usage, customer experience, and perceived changes in daily life approximately four months post-installation.

Key findings

1. The service expands access to lighting particularly in low-access areas

Customers report increased access to lighting across all three countries, with more pronounced improvements in Malawi and Sierra Leone, where baseline access was lower. In Malawi, median reported lighting hours increased from 3 to 12 hours per day, and in Sierra Leone, from 10 to 15 hours. In Senegal, the increase is slightly more moderate (from 5 to 11 hours), reflecting higher baseline access.

[1] International Energy Agency (IEA), Financing Electricity Access in Africa, 2025.

2. Phone charging becomes more accessible

Customers in Malawi and Sierra Leone report reduced costs and increased convenience of phone charging, including eliminating travel to charging points. In Malawi, customers previously reported traveling a median of 6 km to charge. In Senegal, where local charging options were already available, reported changes are more limited.

3. Customers report positive value for money

In all three countries, most customers report that the service is affordable and represents good value relative to prior spending on lighting or charging. Across all three pilots, more than 90% of customers reported an improvement in their quality of life after having their SHS installed via EaaS, and across the board, Net Promoter Scores rank from 89-98%. A minority of customers, concentrated in Senegal, highlight limitations in system capacity, which can affect perceived value.

4. Payment challenges vary significantly across contexts

While most customers report being able to make payments, reported challenges differ across countries. In Malawi, 17.3% of customers report experiencing payment difficulties, compared to 1.5% in Sierra Leone. These challenges appear to be linked to a combination of income variability and operational factors such as connectivity, payment processes, and availability of mobile money.

REAL Programme Catalyst's Energy-as-a-Service model **for solar home systems**

The Energy-as-a-Service (EaaS) model can be applied to several technological contexts including networks, mini-grids, productive use appliances (PUE) and solar home systems (SHS).

In this report, EaaS refers to the deployment of solar home systems as infrastructure, at scale and with a long-term view, through a service-based model.

In this model, designed by REAL Programme Catalyst, households are not required to purchase solar home systems or equipment, but pay a small fee for a continuous energy service that includes installation, maintenance, and support.

REAL Programme Catalyst's EaaS model is designed to address the historical barriers to sustained energy for the poorest and most remote communities left behind by existing energy access approaches. Under this collaborative approach REAL convenes governments, local operators and community representatives to deliver first-time connections on a service basis with the aim of providing long-term energy access that is truly affordable for customers, and guarantees maintenance, repairs and accessible support services.

This approach underpins REAL Programme Catalyst's ambition to remove financial and geographical barriers, accelerate deployment, and ensure the sustainability of the service over a period of 10+ years.

Table 1 – Key indicators by country

Indicator	Malawi	Senegal	Sierra Leone
Sample size (n)	266	129	201
Median lighting hours (before / after)	3 / 12	5 / 11	10 / 15
Reported payment challenges (%)	17.3%	6.2%	1.5%
First access to a Solar Home System (%)	90.9%	61.7%	77.5%
Customers reporting QoL improvement (%)	99.2%	99.2%	90.5%
NPS	98.5	89.1	98.5

The strong concentration of high percentages in recommendation and quality of life scores present a valuable opportunity for deeper exploration, particularly when considered alongside other indicators that display greater variability. Examining these patterns could help uncover meaningful insights into the drivers of these consistently high ratings.

Additionally, the difference in reported improvements across countries suggests a correlation or relationship with varying baseline levels of access. Gathering and analysing additional data in this area could provide a clearer understanding of these dynamics and support more targeted, evidence-based enhancements for REAL Programme Catalyst's future projects.

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2. ABOUT THIS REPORT

Purpose

In 2025, REAL Programme Catalyst partnered with SÉKOU to assess the impacts of their early Energy-as-a-Service pilots.

This report presents self-reported experiences of households using solar home systems (SHS) delivered on an Energy-as-a-Service basis across three pilot countries: Malawi, Senegal, and Sierra Leone.

These pilots were deployed in areas specifically selected because they are underserved. It documents how users perceive the service several months after installation, how they use it, how they experience the customer journey, and what changes they report in their daily lives.

The study was commissioned by REAL Programme Catalyst and conducted independently by SÉKOU, a consulting firm specialising in development programmes in sub-Saharan Africa. SÉKOU designed the survey instrument, coordinated data collection with local partners, and carried out the analysis presented in this report.

This is a customer perception survey. It is not an impact evaluation, and does not assess the operational or financial performance of the service model.

Study design and sample

This is a snapshot survey conducted approximately four months after installation. A total of 596 households were surveyed across Malawi (n=266), Senegal (n=129), and Sierra Leone (n=201) representing around 10% of the total active customer base in each pilot. Across the three pilots combined, this represents approximately 30% of roughly 2,000 households connected at the time of the survey. Data collection took place between mid-November and mid-December 2025.

There is no baseline measurement: all comparisons between "before" and "after" installation are based on respondents' recollections at the time of the survey, and should be interpreted accordingly.

Data collection

The collection of data was facilitated by the local operators' team, the analysis and report herein were carried out by SÉKOU. In Malawi and Sierra Leone, interviews were conducted face-to-face; in Senegal, by phone. Surveys were administered in local languages: Chichewa in Malawi; Krio, Temne, and English in Sierra Leone; and Wolof, Peul, Mandingue, Diola, and French in Senegal. These two modes produce systematically different conditions and should be considered when comparing results across countries.

How to read the results

The findings are based on self-reported data and should be understood as indicative signals of customer experience, not as definitive evidence of impact and not statistically representative of all users of solar home systems via Energy-as-a-Service. Differences across countries may reflect variations in baseline access, implementation context, and local infrastructure. Results are presented by country, rather than as aggregated totals, except where explicitly noted.

3. WHO WE SPOKE TO

Across the three countries, households share several common characteristics that reflect rural and peri-rural contexts with limited access to infrastructure and services. At the same time, variations exist between countries, which should be considered when interpreting the results. For example, the results indicate that the Malawi sample has the smallest household sizes, lowest asset ownership, and most limited phone access. Senegal has the largest households, highest asset ownership, and near-universal phone access.

Where the pilots operate

Malawi

The survey was conducted in Traditional Authority Kasakula, a rural village in Ntchisi District in the Central Region of Malawi. The context is typical for deep off-grid rural Malawi: very limited grid infrastructure, near-universal dependence on biomass for cooking, and low household asset ownership.

Senegal

Moon's pilot operates in the Casamance region, in southern Senegal, a geographically distinct area, separated from the rest of the country by The Gambia, and characterised by a mix of rural and peri-urban communities with limited grid access.

Sierra Leone

Easy Solar's survey covered four localities: Bamoi Munu, Kamba Bana, Rolal Kemanthma, and Romeni. All four are rural settlements.

Figure 1 - Gender distribution by country

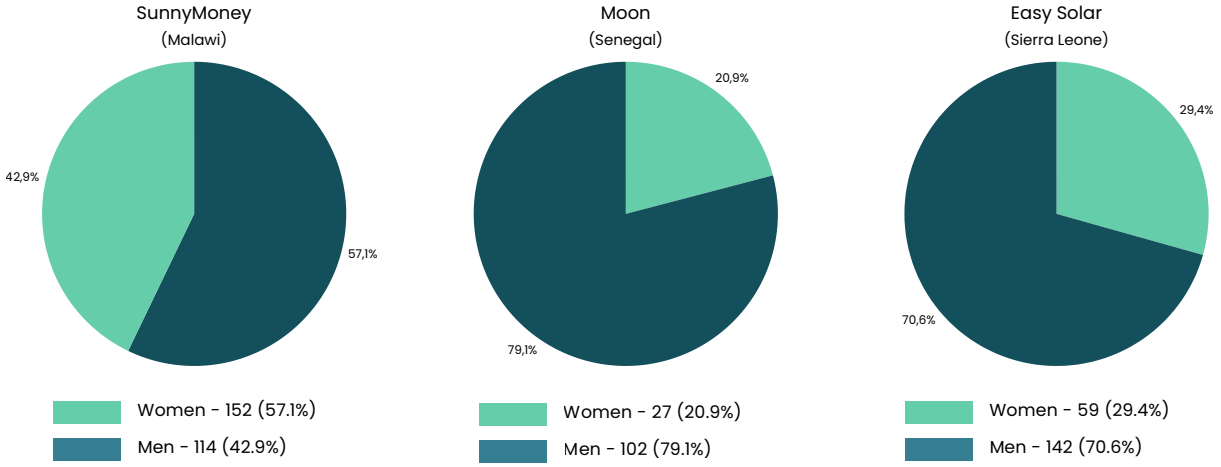
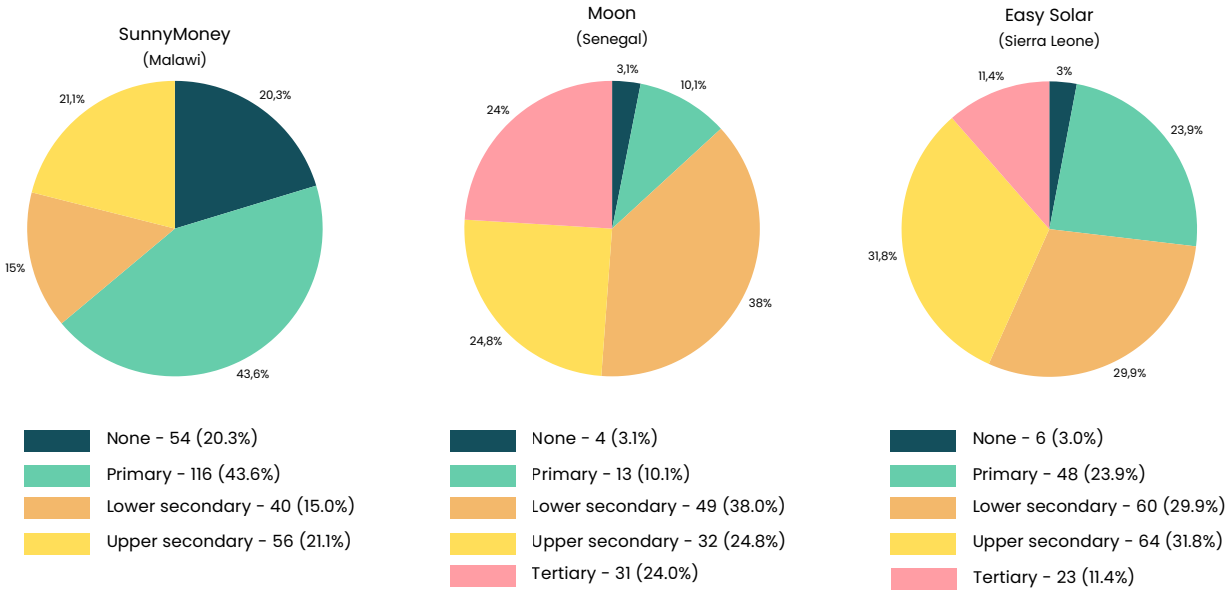


Figure 2 - Highest education levels completed by any household member



The highest education levels completed by any household member (not necessarily the respondent) vary significantly across the three countries. A significant share of households report limited formal education, while others include at least one member who has attended secondary or tertiary school. These differences are important when interpreting results related to onboarding, understanding of the service, and interaction with payment systems, as household education levels may influence how easily users navigate the customer journey.

Table 2 - Other socio-demographic information

Indicator	Malawi n=266	Senegal n=129	Sierra Leone n=201
Respondent median age	35 years (n=243)	38 years (n=121)	38 years (n=124)
Median household size	4 members	11 members	10 members
Female head/spouse with no formal education	58.8% (104/177)	43.3% (55/127)	66.7% (132/198)
Phone ownership	57.1% (152/266)	99.2% (128/129)	83.1% (167/201)
TV ownership	0.8% (2/266)	18.6% (24/129)	4.5% (9/201)
Cooking: firewood / biomass	100% (266/266)	96.9% (125/129)	100% (201/201)

Notes

Age: the valid sample is smaller than the total sample because some respondents did not know their age or refused to answer (particularly common in Sierra Leone, n=124/201).

Household size: The gap between Malawi (4) and Senegal/Sierra Leone (11/10) is significant, where households tend to be relatively large, often including extended family members. This has implications for how energy is used, particularly for lighting and phone charging, which are shared across multiple users.

The highest level of education attained by the female head or spouse was calculated for households with a female head or spouse (excluding those with 'No female head/spouse').

Phone and TV ownership: Mobile phone ownership is widespread among respondents, and are often used for payments and communication with service providers. Access to other devices such as televisions remains limited.

Cooking: Most households rely on traditional cooking fuels such as firewood or charcoal. This indicates that, despite gaining access to electricity for lighting and small appliances, households remain dependent on biomass for cooking. In Senegal, the four households excluded (3.1%) report using only 'gas, electricity, solar energy or kerosene/paraffin' as their sole cooking fuel.

4. SERVICE EXPERIENCE: WHAT CUSTOMERS REPORT

Table 3 - Prior access and available alternatives

Indicator	Malawi n=266	Senegal n=129	Sierra Leone n=201
Prior access: grid	0%	1%	3%
Prior access: solar (SHS or lantern)	5%	47%	32%
Prior access: torch/flashlight	64%	25%	86%
Prior access: kerosene/paraffin	4%	4%	0%
Prior access: candle	5%	11%	0%
First access to a solar system (% Yes)	91%	61%	78%
Cannot easily find alternative (% No)	97%	64%	86%
Reported 0 hours of lighting before	22%	6%	<1%

Prior energy access, by country. Lighting categories are not mutually exclusive (respondents could select multiple options).

Notes

Malawi stands out for its near-total absence of prior solar use (5%), this is the strongest indicator of energy poverty across the three pilots. The very high rates of difficulty finding an alternative (86–97% across Malawi and Sierra Leone) confirm that the pilots operate in markets with limited substitutes, even if the Senegal figure (64%) reflects a somewhat more contested varied context.

REAL Programme Catalyst's model deploys solar home systems through Energy-as-a-Service. This differs from current last mile access delivery models in that, rather than pay a single lump sum upfront for their SHS, customers pay a small service fee for energy connection, which covers their SHS installation, maintenance, servicing and repair. REAL's aim with this model is to address traditional barriers to sustained energy for the poorest, most remote communities left behind by existing energy access models. In this respect, this segment of the survey is critical to understanding their model's ability to reach its target communities, and assess the level and quality of service provision the pilots achieved.

Understanding what customers used before the current solar system is essential to contextualising the pilots' reach. The survey asked whether the current system is the respondent's first solar system, what they previously used for lighting, and whether they could easily find an alternative if the system were no longer available.

The data consistently indicates populations with limited or no prior access to reliable energy, and in the case of Malawi, to near-total energy poverty. 91% of respondents in Malawi report this as their first solar system, and only 5% had previously used any form of solar device. This is the lowest figure across the three pilots and the strongest single indicator of the depth of household energy deprivation. In Sierra Leone, most households relied on torches, batteries, or informal charging services prior to installation (86% reported using a torch/flashlight). In Senegal, prior solar access was more common (47%), but respondents frequently describe these as small, low-quality devices rather than comparable alternatives. Across all three pilots, virtually no households had access to grid electricity before installation (0% in Malawi, 1% in Senegal, 3% in Sierra Leone).

Deep energy access challenges across all countries are reinforced by responses on the availability of alternatives. Across Malawi and Sierra Leone, 97% and 86% of respondents respectively said they could not easily find a good alternative if the service were no longer available confirming that these pilots operate in markets with limited substitutes. Even in Senegal, where the context is more mixed, 64% of respondents report the same, suggesting that for the large majority of customers across all three pilots, EaaS service addresses a need with no meaningful substitute.

> ***I can't find a good alternative to the Moon solar kit given the product quality, customer service and the monthly price I pay.***
>
> Customer in Senegal

> ***The children had to use candles or the light from their phones.***
>
> Mariama Seydi,
> Customer in Senegal

However, the data also shows that not all households were starting from zero, especially in Sierra Leone and Senegal where a significant share already had experience of solar access (44–48%). In Senegal, responses highlight that existing solutions were often fragmented, unreliable, or of limited capacity. In addition, some households continue to rely on alternative sources alongside the system, suggesting that the service does not fully replace previous practices in all contexts. Notably, the survey did not capture the type or quality of prior solar devices; the category 'previous lighting: solar' may include a wide range of products, from basic solar lanterns to larger solar home systems.

The data indicates differences in customer profiles across the three pilots: Malawi is primarily a context of first-time solar access; Senegal includes a significant replacement dynamic; and Sierra Leone sits between the two.

> ***(I had) A small solar panel that I'd bought at the local market***
>
> Customer in Senegal

Delivered service: lighting, charging and everyday use

Customers across the three countries report a substantial increase in access to lighting after the installation of the solar home system as-a-service.

In Malawi, median reported daily lighting hours increased from 3 hours before the system to 12 hours, after installation, a fourfold increase in a context where 22% of respondents had no access to lighting at all before the system. In Sierra Leone, reported lighting hours increased from 10 to 15 hours. In Senegal, the increase is also meaningful, from 5 to 11 hours, more than doubling prior availability.

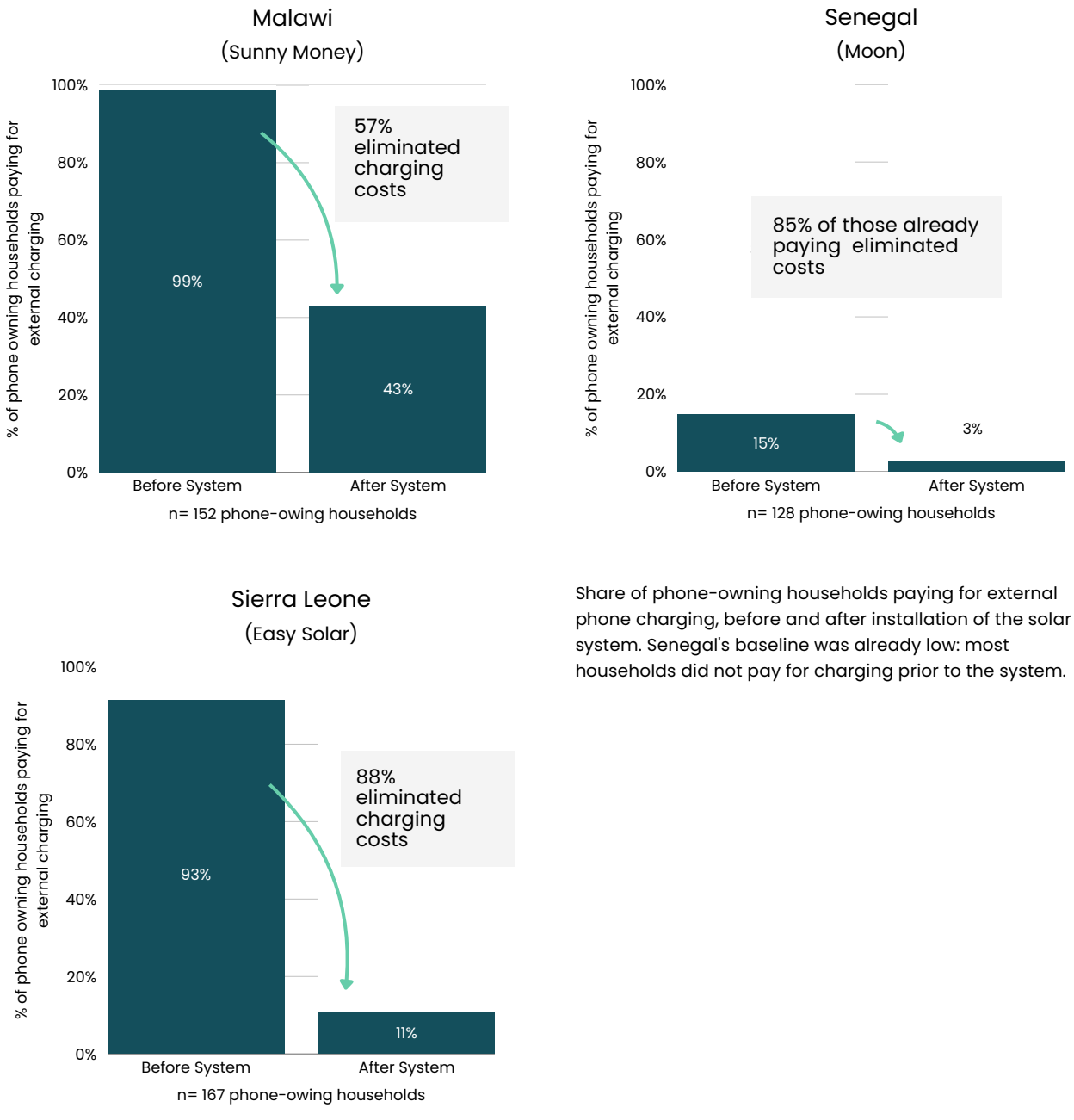
Across all pilots, the majority of customers report increased lighting access. A closer analysis reveals important variations at country level. In Malawi, 22% of respondents reported having no access to lighting before the system, indicating particularly low baseline access among part of the sample. In Senegal, several customers report that the system does not fully meet their household needs, particularly in terms of coverage across rooms or duration of use through the night, with repeated suggestions related to system capacity.

> ***We work at night now, which was not possible before.***
>
> Customer in Sierra Leone

On phone charging, households in Malawi report a reduction in both cost and effort. Among the 57% of households that own a phone, the median reported weekly expenditure on charging decreased from 1,200 Malawian kwacha ($0.69) before installation to zero after. Before the system, the median reported distance travelled to charge a phone was 6 km, with some households reporting distances of up to 15 km. Sierra Leone shows a similar pattern based on customer responses. In Senegal, most customers report already having access to nearby charging options prior to installation, and report limited change in this aspect.

Taken together, the results indicate that the service is associated with improved access to lighting and basic energy services for most customers, particularly in contexts with lower baseline access, while reported improvements are smaller in contexts where prior access to lighting was already present or where system capacity does not fully meet household needs.

Figure 3 - Phone charging: share of households paying for external charging



Share of phone-owning households paying for external phone charging, before and after installation of the solar system. Senegal's baseline was already low: most households did not pay for charging prior to the system.

Onboarding and understanding the service

REAL Programme Catalyst's model assumes that a smooth onboarding experience is essential not just for user satisfaction, but for payment continuity. Customers who don't understand the system from the start are more likely to encounter difficulties, miss payments, or disengage early. As part of its programme development, REAL therefore continuously monitors and iterates with its pilot operators, to assess how different resourcing and payment models affect customer experience and project revenue.

Most customers report that the onboarding and installation process was straightforward. Across the three countries, the majority of customers rated the sign-up and installation process as easy: 100% in Malawi, 93.5% in Sierra Leone, and 88.9% in Senegal, suggesting that initial access to the service is well managed. Customers frequently describe a smooth transition from no or limited electricity access to using the system, with minimal reported barriers at the point of installation.

> ***When we have a problem, we call customer service using the number provided in the contract.***
>
> Customer in Sierra Leone

Some customers report challenges related to understanding how to use the system, particularly in the early stages. In Senegal, where most customers pay for their services directly using mobile money,[2] several responses highlight difficulties with entering long activation codes or understanding how the system operates.

These challenges appear to be more related to system interaction than to the installation process itself. In other contexts, a small number of customers mention needing additional support to fully understand how to use or manage the system.

> ***"His son usually enters the code. The client didn't attend school, only Quranic school, so he sometimes gets confused with the numbers."***
> Customer in Senegal

> ***The code is very long, making it difficult to enter.***
>
> Customer in Senegal

This suggests that while the onboarding process is generally accessible for most customers, some aspects of system usability, particularly those requiring repeated interaction or technical understanding, may require additional support or simplification depending on the context.

[2] In Sierra Leone and Malawi, due to lower mobile money penetration, the operational model includes community based representatives who facilitate customer payment processes.

Payment experience and reported challenges

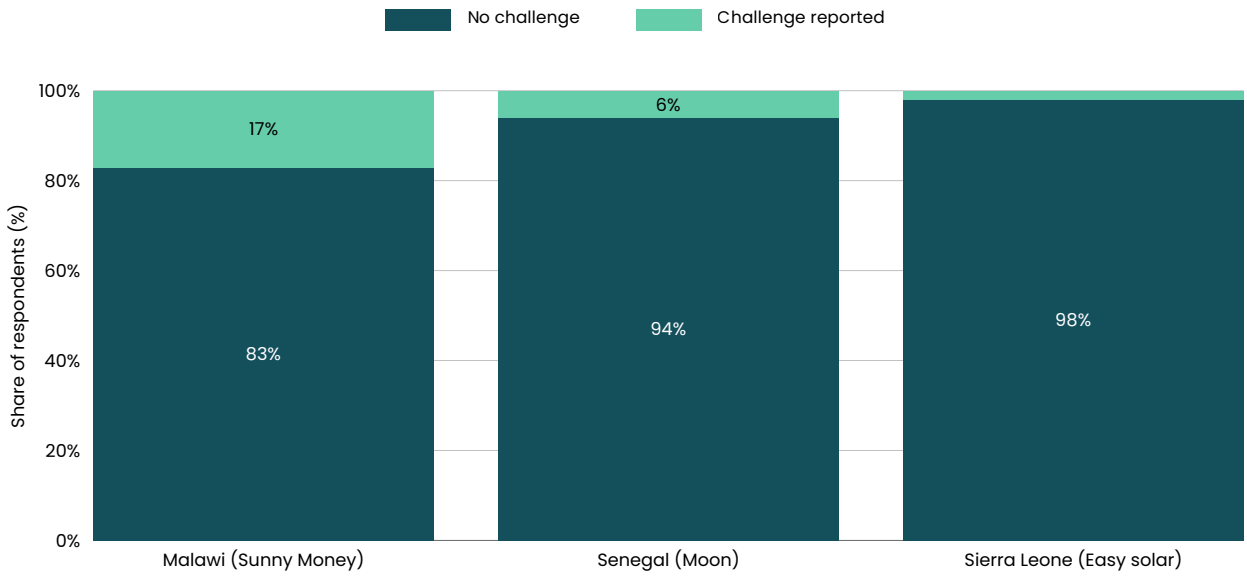
Regular, frictionless payments are the financial backbone of the EaaS model developed by REAL Programme Catalyst. It finances operations, maintenance, and long-term service delivery. REAL's assumption is that minimising payment friction is a core operational requirement, not a secondary concern.

Across the three countries, customers pay for the service through different channels: directly by mobile money in Senegal, and through a combination of direct payments and community-based representatives in Malawi and Sierra Leone. The majority report no challenges in the payment process: 98.5% in Sierra Leone, 93.8% in Senegal and 82.7% in Malawi. Responses suggest that for most customers, the payment system is functional on a day-to-day basis.

> ***I'm able to save the money that was used to buy batteries and use it for other activities.***
>
> Customer in Sierra Leone

> ***It's cheap, hence you don't spend much money and it is directed for other things.***
>
> Customer in Sierra Leone

Figure 4 - Payment process: share of households reporting a challenge



Respondents who reported "Yes" to the question: "Have you experienced challenges with the payment process?"
Share of households reporting a challenge with the payment process, by country. Darker segment = households reporting at least one challenge. n = 266 (Malawi), 129 (Senegal), 201 (Sierra Leone).

However, a non-negligible share of customers report challenges related to the payment, with important variation across countries. In Malawi, 17.3% of customers report experiencing difficulties when making payments, compared to significantly lower levels in Sierra Leone (1.5%). The most frequently cited causes are delays in receiving payment tokens, network connectivity issues affecting message delivery, and dependence on programme staff members or associated community representatives whose processing times add latency.

> ***We had challenges buying units especially when we used to purchase through community channels. But now all is fine with mobile money systems.***
>
> Customer in Sierra Leone

> ***The solar representative often waits for people to pay in bulk before he can report and send our codes. This is an inconvenience, I want to be able to buy top-up instantly at any time.***
>
> Customer in Sierra Leone

Payment friction is not uniform across pilots, particularly between Malawi and Sierra Leone. While the payment process is generally functional for most customers, the results point to issues related to payment processes, including delays in token delivery, reliance on intermediaries, or the level of connectivity. Some customers also report difficulties making payments at certain times, although the survey does not provide further detail on the underlying causes. Further analysis would be needed to understand the underlying drivers, including income patterns, payment channels, and local infrastructure.

According to REAL, there were some notable changes in payment processes during the pilot implementation, particularly in the Malawi pilots. In both Sierra Leone and Malawi, largely driven by the limited mobile money availability, the operational model has included community based representatives. In Malawi, as mobile network and agent coverage have increased, the operator began facilitating direct customer payments through mobile money.

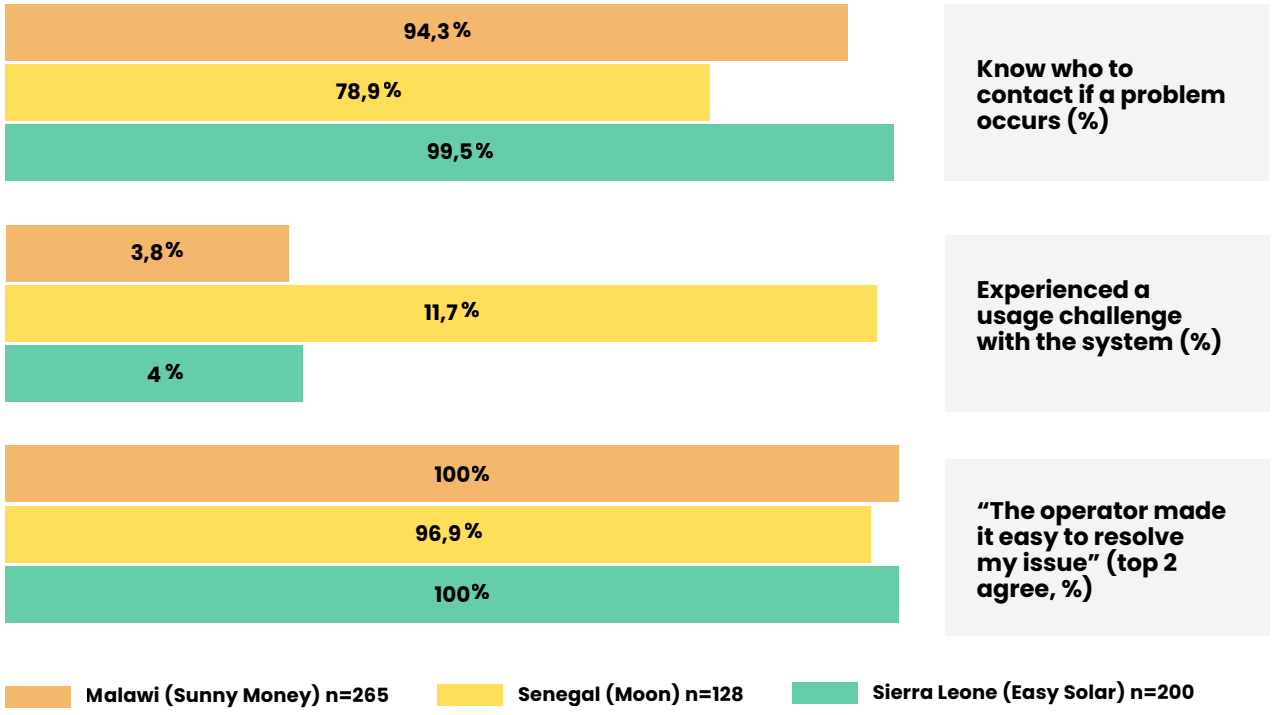
Pictured: Thauzeni Chibweza with his wife Carol outside their house in Kasakula, Malawi.
Photo credit: SolarAid / Kondwani Jere

Customer support and issue resolution

Ongoing customer support is central to REAL Programme Catalyst's EaaS model, and distinguishes its offering from traditional commercial operations such as PAYGo rent-to-own, or donation-based energy access initiatives. REAL operates on the assumption that rapid issue resolution is critical both for customer satisfaction and for payment continuity. An unresolved technical problem poses a risk of payment interruption. Understanding how customers experienced this aspect of their service, and the level of support provided was a key objective of this report.

The payment difficulties discussed above are distinct from system usage challenges. While 17.3% of Malawi customers reported difficulties in the payment process, a much smaller share (3.8% in Malawi) reported experiencing challenges using the system itself. These are captured separately in the survey and reflect different facets of the service experience.

Figure 5 - Customer support: key indicators across the three pilots



Customer support: key indicators across the three pilots. "Experienced a usage challenge" — lower values indicate fewer reported issues. "The operator made it easy to resolve my issue" — Top 2 agree (Agree + Somewhat agree). n = 266 (Malawi), 129 (Senegal), 201 (Sierra Leone).

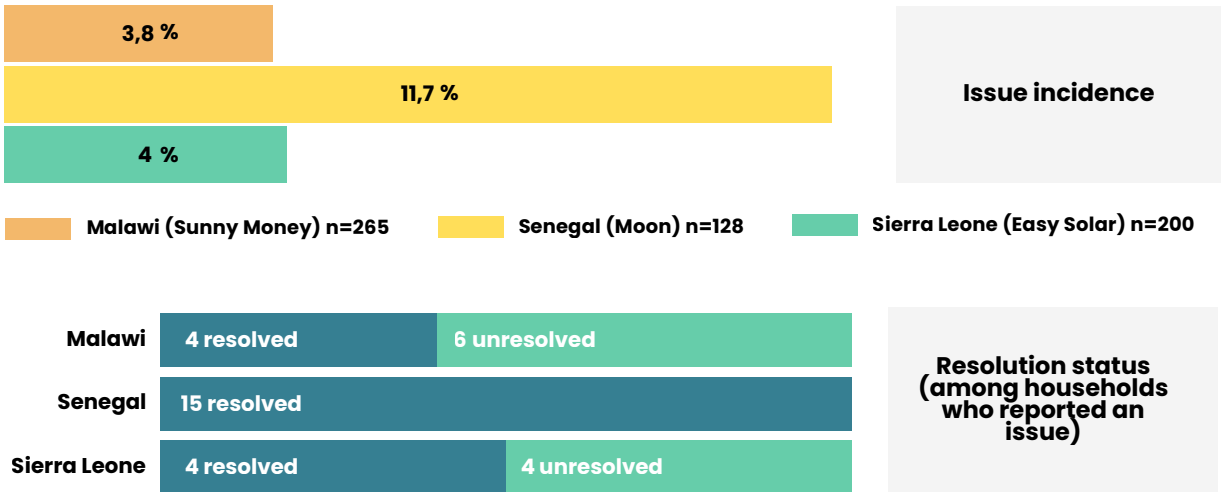
Most customers report knowing who to contact if they have a problem with their Energy-as-a-Service (94.4% in Malawi, 99.5% in Sierra Leone, and 79.1% in Senegal) and responses suggest that support channels are generally accessible. Among those who experienced a problem, a large majority indicated that their issue was resolved and that the process was relatively easy to manage.

Usage challenges were rare: 3.8% of Malawi respondents, 4.0% in Sierra Leone, and 11.6% in Senegal reported experiencing difficulties using their system, which limits the depth of analysis on support performance. When issues did occur, overall satisfaction with the support process was high: 99.6% in Malawi, 99.0% in Sierra Leone, and 96.9% in Senegal agreed or somewhat agreed that the operator made it easy to handle or resolve their issue. This figure reflects customers' perception of the responsiveness and accessibility of the support process, not a confirmed resolution rate. Resolution outcomes are reported separately below.

> ***Customer service is always available when we have a problem; they respond to us and explain what to do***
>
> Customer in Senegal

> ***When I had a problem, they helped me quickly***
>
> Customer in Sierra Leone

Figure 6 - Usage issue: incidence and resolution status



Usage issues: incidence and resolution status. Left panel: share of all respondents who reported a usage challenge. Right panel: resolution status at the time of the survey, restricted to households who reported an issue. Senegal: all 15 reported issues were resolved. Malawi and Sierra Leone: a proportion of reported issues remained unresolved at the time of data collection.

However, the resolution data for active cases is more mixed: in Malawi, 6 out of 10 respondents who reported a usage problem indicated the issue was unresolved at the time of the survey. In Sierra Leone, 4 out of 8 similarly reported the issue as unresolved. In Senegal, all 15 respondents who had experienced a usage challenge reported it as resolved.

This suggests that while customer support systems appear to function effectively for most customers, some reported cases remain unresolved at the time of the survey.

Across the three pilots, REAL Programme Catalyst and pilot operators stated that they are currently working to further improve the response time which they see as critical for ensuring high customer satisfaction and payments, which in turn defines the project's long-term sustainability.

> ***A cable disconnected which caused the lights to go off — and once there is not enough sunlight, the light goes off around midnight. It doesn't serve me all night and the battery doesn't get to 100%.***
>
> Customer in Sierra Leone, unresolved issue

> ***Sometimes it takes time before the system is fixed.***
>
> Customer in Malawi

5. PERCEIVED CHANGES IN DAILY LIFE

Lighting availability and daily routines

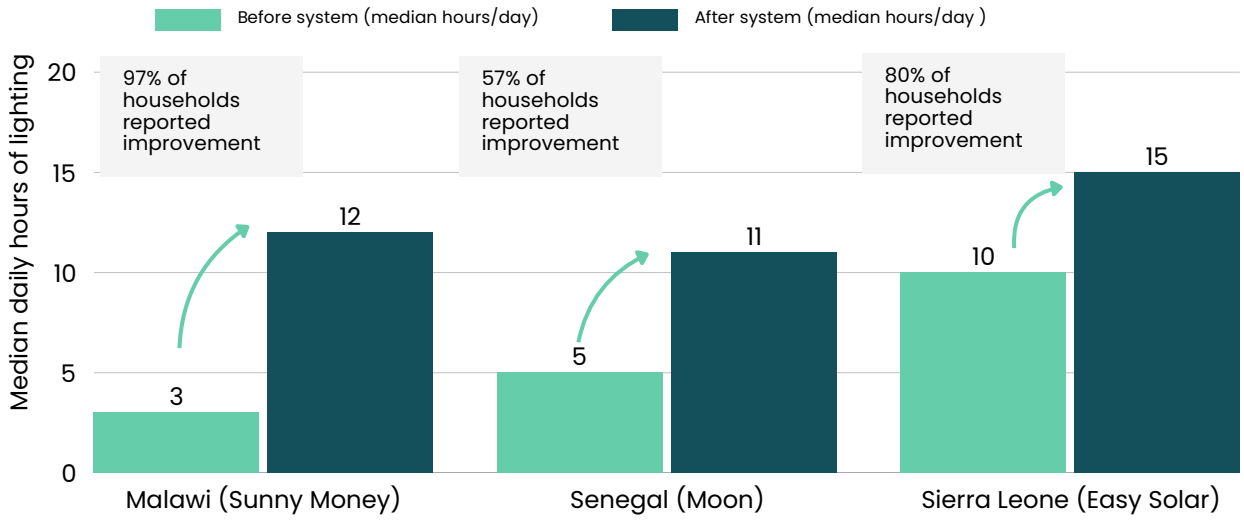
Customers across the three countries report that increased access to lighting has changed how they organise their daily activities. In Malawi and Sierra Leone in particular, where baseline access to lighting was lower for part of the sample, customers frequently describe being able to extend activities into the evening. Reported changes include working after dark, spending more time with family, and carrying out household tasks that were previously limited by lack of light.

> ***I work on my nets at night. I am a fisherman. I didn't do this before.***
>
> Pa Abu Sesay, Customer in Sierra Leone

> ***We prepare our brooms for sale at night from palm thatch. And we now produce and sell more brooms. I am the town chief I also resolve a lot cases at night***
>
> Ishaka Koroma, Customer in Malawi

> ***I am a teacher so it helps me in results and report card preparation. It helps in lesson planning. It has made my teaching job easier***
>
> Morlai Kamara, Customer in Malawi

Figure 7 - Daily lighting hours: before and after the solar system



Distribution of self-reported daily lighting hours before (grey) and after (colour) installation, by country. Each bar represents the share of respondents reporting that number of hours. n = 266 (Malawi), 129 (Senegal), 201 (Sierra Leone).

In addition to lighting, customers report using the SHS for basic energy services such as phone charging and small daily activities. Across the three countries, access to these services at home appears to reduce reliance on external solutions, particularly in contexts where alternatives were previously limited or required travel. The extent of change varies across countries, reflecting differences in prior access and local infrastructure.

This suggests that increased lighting availability is associated with greater flexibility in daily routines for many customers, particularly in lower-access settings, while the extent of change appears to depend on prior access levels and the capacity of the system to meet household needs.

> ***Increase the power of the box so that all our rooms can have light.***
>
> Customer in Senegal

Phone charging: practices and costs

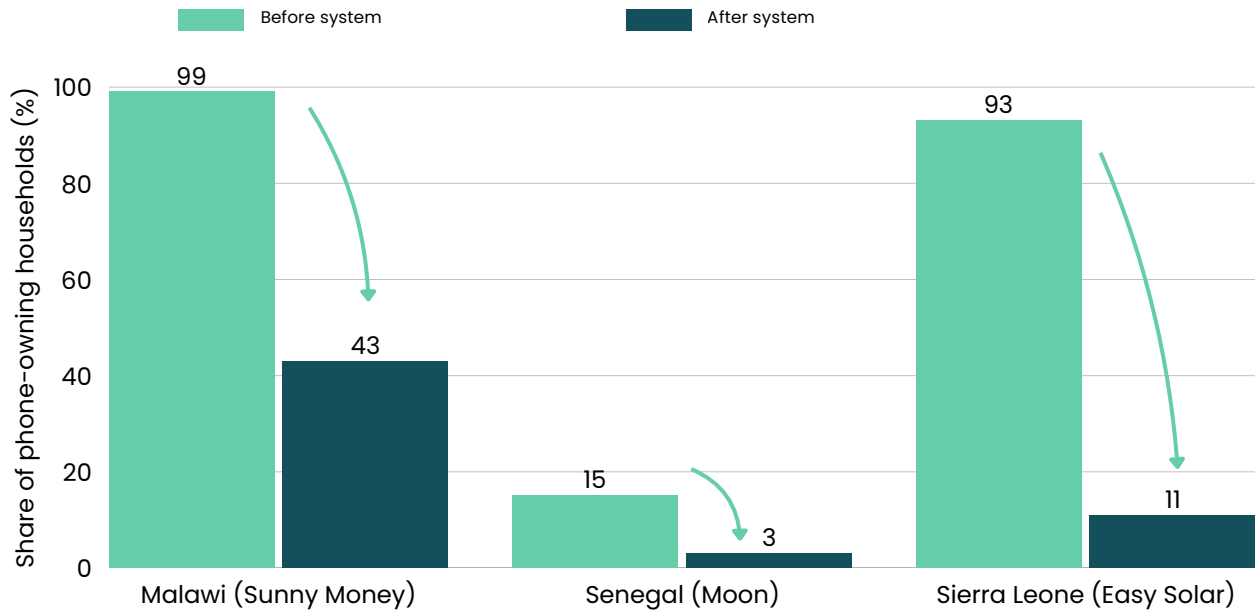
Customers report changes in how they charge their phones after installing the SHS, particularly in contexts where access to charging was previously limited. In Malawi, customers who own a phone reported weekly spending on phone charging decreases significantly after installation (from 1,200 Malawian kwacha / $0.69 to zero), and customers also report reduced need to travel to access charging services (households previously traveled a median of 6 km to charge, some as far as 15 km).

Some customers describe this as both a financial and time-saving benefit. In Sierra Leone, customers also report improvements in access to phone charging, often linked to increased convenience and the ability to charge devices at home. In Senegal, most customers report already having access to nearby charging options prior to installation, and report limited change in this aspect.

> ***I can now charge my phone at home and don't need to travel.***
>
> Customer in Sierra Leone

> ***I used to spend money to charge my phone, now I don't.***
>
> Customer in Malawi

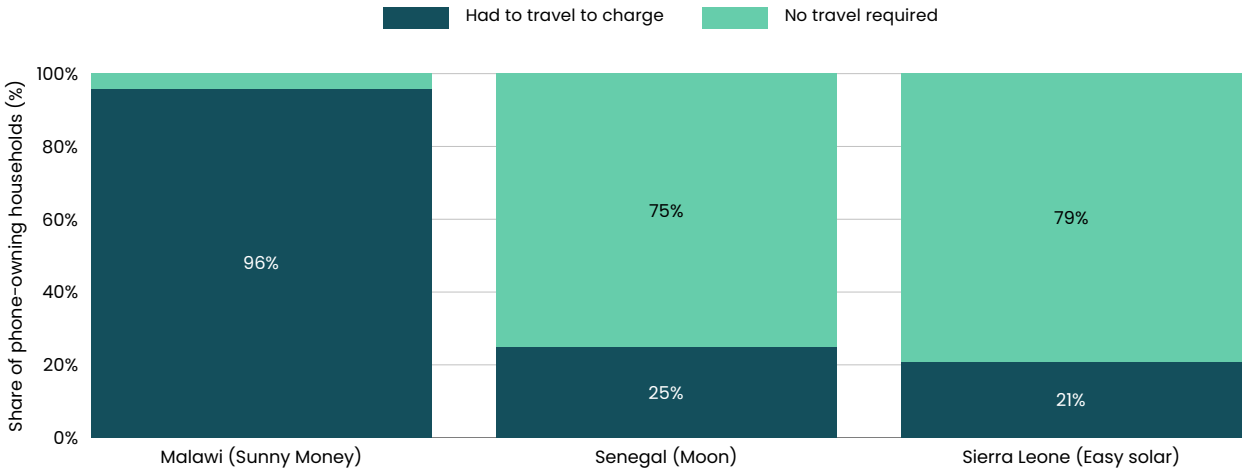
Figure 8 - Phone charging: share of households paying for external charging



Share of phone-owning households paying for external phone charging, before and after installation of the solar system. Senegal's baseline was already low (15%), reflecting existing access to local charging in parts of Casamance. n = 152 (Malawi), 128 (Senegal), 167 (Sierra Leone).

At the same time, not all customers emphasise phone charging as a primary benefit, particularly in contexts where alternative solutions were already available. In Senegal, most customers report already having access to nearby charging options prior to installation, and report more limited changes in both cost and travel. In these cases, phone charging appears to be one of several services provided by the system rather than a key driver of perceived value. This suggests that access to phone charging at home is associated with reduced costs and effort for many customers, particularly in lower-access settings, while the magnitude of change depends on prior access to charging services.

Figure 9 - Phone charging before system: share of households who had to travel to charge



Share of phone-owning households who had to travel to charge their phone before installation. Recorded before the system was installed. For Malawi, where travel was near-universal (96%), the median distance travelled was 6 km. n = 152 (Malawi), 128 (Senegal), 167 (Sierra Leone).

Quality of life

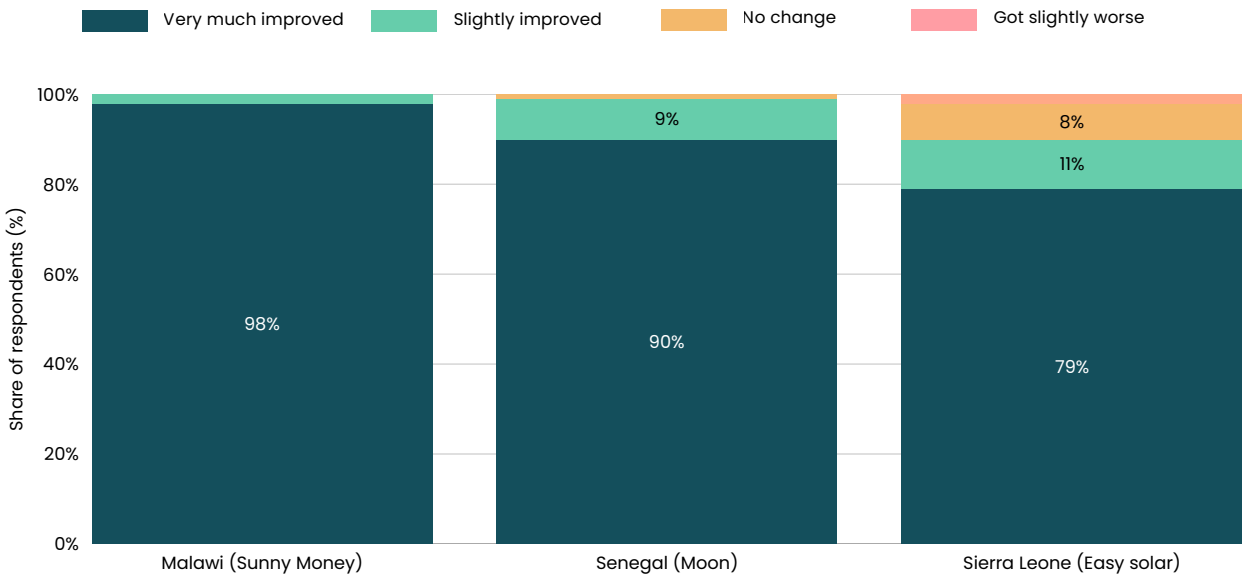
Most customers report a perceived improvement in their quality of life after becoming a customer of the EaaS service. Across the three countries, a large majority indicate that their living conditions have improved, often linking this change to increased access to lighting, greater convenience, and the ability to carry out more activities at home. Customers frequently describe feeling more comfortable in their daily lives, with references to improved household organisation, increased time for productive or social activities, and reduced reliance on less reliable or more costly alternatives.

In Sierra Leone, 79.1% report their quality of life has "very much improved" and 11.4% "slightly improved" — a combined 90.5%. In Senegal, 89.9% reported very much improved and 9.3% slightly improved. In Malawi, 98.5% reported very much improved and 1.5% slightly improved.

> ***I'm living a comfortable life as I know I'm safe and also I'm investing the money I was using before.***
>
> Customer in Sierra Leone

> ***It has greatly improved our life since we got this easy solar system.***
>
> Yainkain Sankoh, Customer in Malawi

Figure 10 - Reported change in quality of life since installation



Reported Change in Quality of Life Since Installation: Across all three pilots, the overwhelming majority of households report a clear improvement in quality of life since receiving their solar system. Malawi (98%) and Senegal (90%) show the strongest positive responses. Sierra Leone has a broader spread, with 11% reporting slight improvement and 7.5% reporting no change.

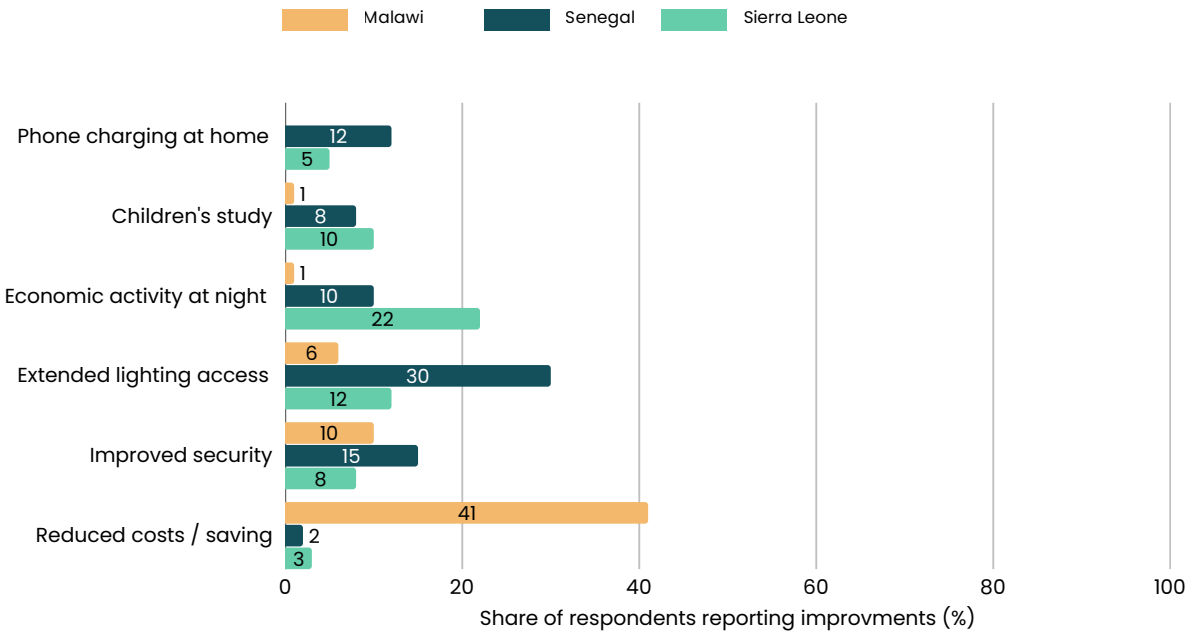
However, not all customers report a significant change in their quality of life. A minority indicate that the system has not significantly altered their situation, particularly in contexts where some level of access to lighting or energy services already existed. In Sierra Leone, 7.5% of respondents report no change in quality of life and 2.0% report that it has gotten slightly worse. The reasons given for deterioration are nuanced: some respondents describe unintended consequences of extended economic activity, such as working night shifts without adequate rest, or spending more on the service than anticipated. In addition, some customers express unmet expectations, often linked to system capacity or limitations in usage.

> ***II now fry cakes for sale late at night. Even though I make more money now, it is tiring but I think it will get better cause we need that additional money too.***
>
> Customer in Sierra Leone

> ***Well I don't sleep much now, as long as the light is on I want to do more work at night but am coping.***
>
> Customer in Sierra Leone

This suggests that while customers widely associate the system with improvements in their daily living conditions, the extent of perceived change varies depending on prior access and how well the system meets household needs.

Figure 11 - Main areas of reported improvement



Quality of Life - Main areas of reported improvement: from open-text responses, the themes of improvement differ markedly by country. In Malawi, cost savings and reduced expenditure on kerosene and candles dominate (41%). In Senegal, extended lighting access is the primary gain (30%), alongside improved security (15%) and economic activity at night (10%). In Sierra Leone, the standout theme is economic activity at night (22%), followed by phone charging at home (12%) and extended lighting (12%).

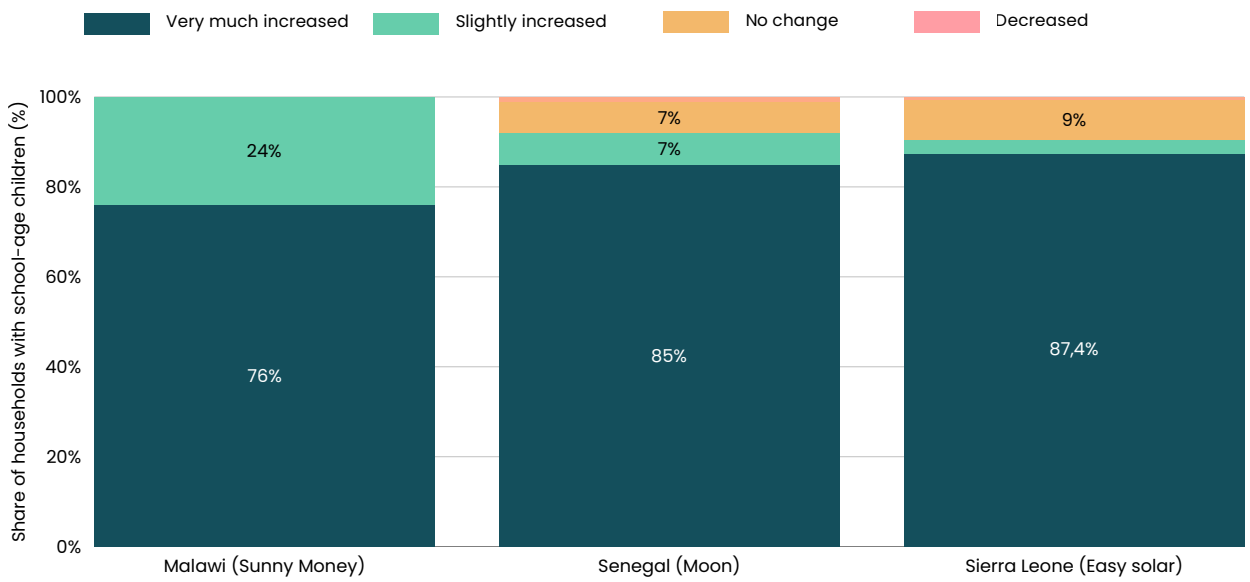
Children's study hours

Among households with school-aged children, many customers report an increase in the time children spend studying after the installation of the solar home system as-a-service. In Malawi, 76% of households with children report study hours have "very much increased." In Sierra Leone the figure is 87%, and in Senegal 85%. Customers frequently associate this change with the ability for children to study after dark in a more consistent and comfortable environment.

> ***The grades of the children have improved.***
>
> Customer in Senegal

> ***My kids study and I spend more time awake with my family.***
>
> Saidu Kamara, Customer in Malawi

Figure 12 - Children's study hours: change among households with school-age children



Children's Study Hours - Change Among Households with School-Age Children: Limited to households with school-age children. The rates of improvement are high for the three pilots. The proportion reporting 'no change' is higher in Malawi (23%).

In addition, a few customers, particularly in Senegal, mention that study habits have not significantly changed, either because children were already studying using alternative lighting sources, or because other factors, such as school schedules or household responsibilities, continue to shape study time. A few customers mention that lighting coverage or system capacity can limit how many children can study at the same time or for extended periods.

> ***The light is not enough for all the children to study at the same time.***
>
> Customer in Senegal

Extended study time for children is one of the most consistently reported household benefits across all three pilots. This suggests that increased access to lighting is associated with improved study conditions for many households, particularly where prior access was limited, while actual changes in study time appear to depend on both household context and the capacity of the system to meet multiple users' needs. Where limitations are mentioned, they appear to reflect spatial or contextual factors rather than a fundamental constraint of the service.

Perceived safety in the home

The majority of customers report feeling safer in their homes after installing the SHS, often linking this change to improved lighting during evening and night-time hours. In Malawi and Sierra Leone in particular, where baseline access to lighting was more limited for part of the sample, customers describe increased visibility around the home as a key factor contributing to this perception. Responses across Sierra Leone and Senegal focus on visibility at night, deterrence of intruders, and the ability to see inside and outside the home after dark.

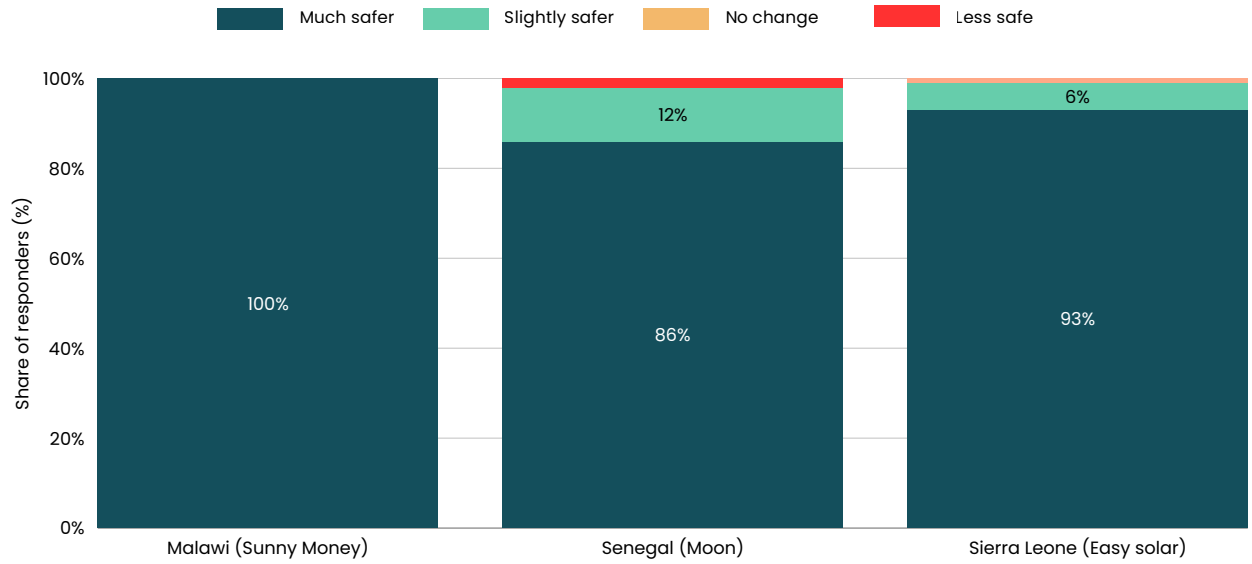
> ***I feel safe, and that makes my job easier.***
>
> Comaboua DJATA, Customer in Senegal

> ***I feel safer now because I can see around my house at night..***
>
> Customer in Sierra Leone

Some customers indicate that their sense of safety has not significantly changed, particularly in contexts where prior lighting solutions already provided a basic level of visibility.

> ***The light is not enough to secure the whole house.***
>
> Customer in Senegal

Figure 13- Perceived safety in the home since installation



Perceived Safety in the Home Since Installation: The sense of safety has improved significantly in all three countries. Sierra Leone recorded 93% "Much safer" and 6% "Slightly safer", representing 99% positive responses. Senegal recorded 86% "Much safer" and 12% "Slightly safer", with 2 respondents (1.6%) stating that they felt less safe. Malawi: 100% "Much safer", with no change recorded.

Value for money

Alongside customer experience, improved value for money is a fundamental tenet of REAL Programme Catalyst's EaaS model. REAL's assumption is that this model is more financially accessible than upfront ownership, and that customers will continue to pay as long as the service demonstrably outperforms the alternatives they previously relied on.

Customer perception of value for money is therefore not just a satisfaction indicator, it is a direct predictor of payment continuity and model sustainability. The organisation asserts that, though customers make no upfront payments for their SHS equipment or connection, comprehensive community connection and aggregate service fees yield better value for money for individual customers, compared to other available options.

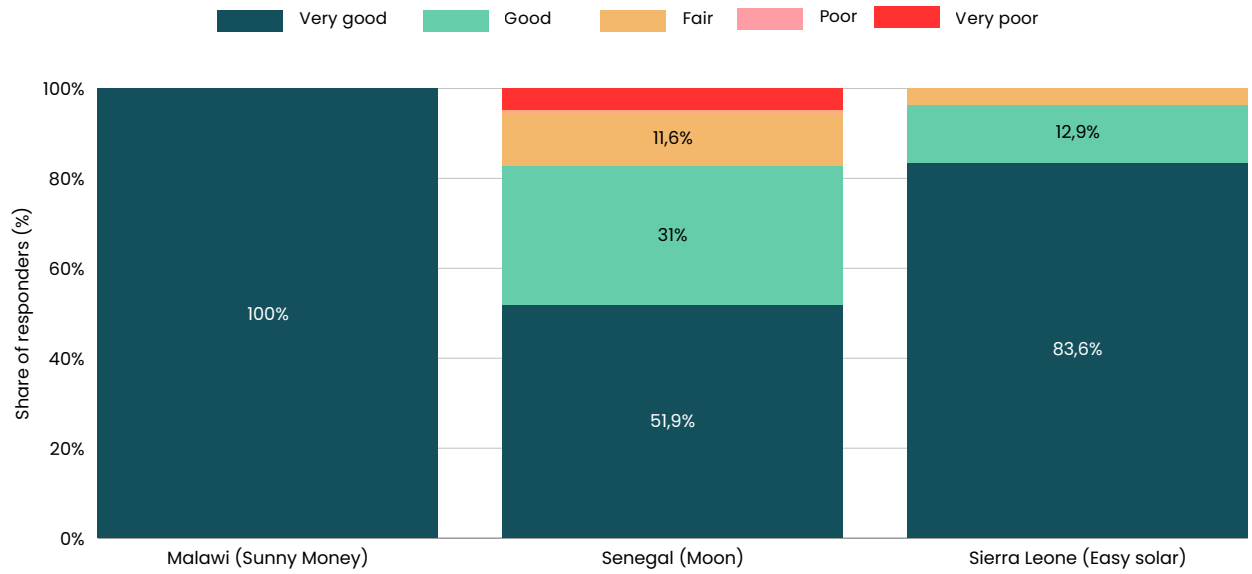
Value for money perceptions are broadly positive and, in most cases, reinforce this assumption. Many customers indicate that the service is affordable relative to the benefits it provides. Across the three countries, responses suggest that customers perceive a positive balance between cost and utility, particularly when compared to previous spending on lighting or phone charging.

> ***It's cheap, hence you don't spend much money and it is directed for other things.***
>
> Customer in Sierra Leone

> ***It is bright and affordable.***
>
> Customer in Sierra Leone

Customers frequently describe being able to reallocate money previously spent on batteries, kerosene, or charging services towards other household needs or small investments. In these cases, customers appear to evaluate value for money not only in terms of price, but also in relation to expected performance.

Figure 14 - Value for money: how customers rate the solar home system



How Customers Rate Their Solar System: Senegal is the only country with a significant distribution: 52% "Very good", 31% "Good", 12% "Fair", 5% "Very poor". Sierra Leone stands at 84% + 13%, making 97% in the top two categories. Malawi records 100% "Very good" with no variation.

A minority of customers, particularly in Senegal, express dissatisfaction linked to perceived system capacity rather than price: insufficient lighting coverage across rooms, or an inability to charge all household phones. These responses suggest that value for money is evaluated not only in terms of cost, but against expected performance. Further investigation by REAL Programme Catalyst and programme partners could help assess how to better align system capacity with household usage patterns.

One finding is particularly noteworthy in Senegal: despite 17% of customers rating value for money as fair or poor, NPS remains at 89.1. This means that customers in Senegal recommend the service even when they consider the value for money to be lacking. The responses confirm this point: dissatisfied customers who rate value for money as “poor” or “very poor” cite the lack of extra bulbs or would like a reduction in the price, but they still maintain an NPS of 9–10.

Overall, customers refer both to affordability and system performance when describing value for money, with more positive assessments where the service meets household expectations and more critical views where there is a perceived gap between cost and delivered functionality.

> ***It’s hard to make ends meet when your income isn’t regular***
>
> Customer in Senegal

> ***This kit doesn't cover all my needs - we can't fully charge all our phones and we'd like to have a television.***
>
> Customer in Senegal

Recommendation rates

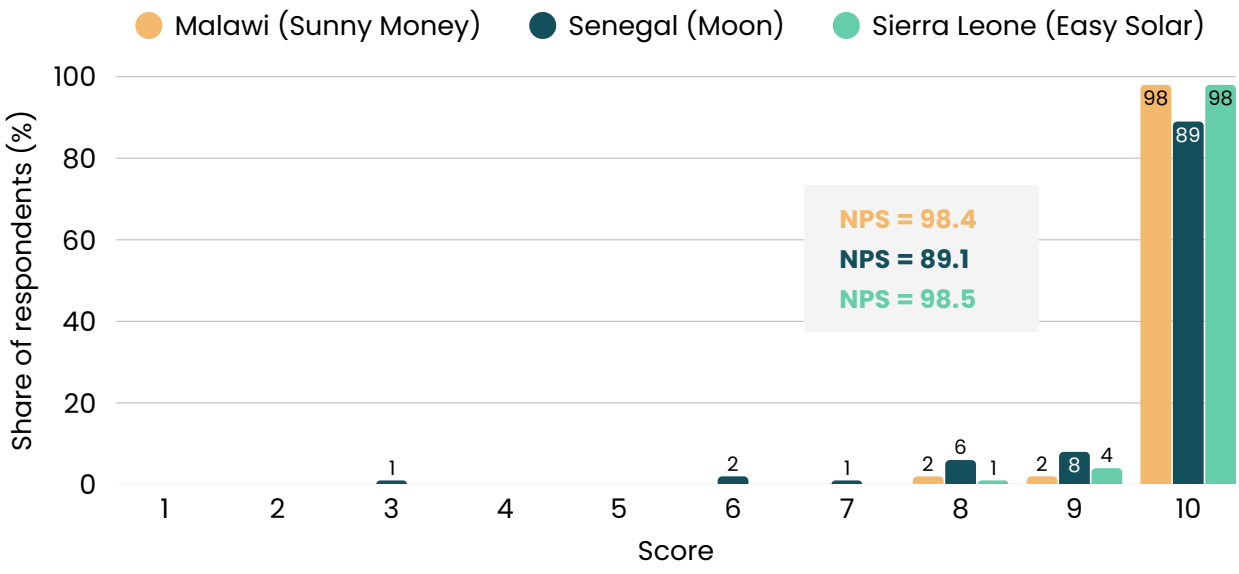
Across the three pilots, customers report a high willingness to recommend solar home systems-as-a-service to others. Reported recommendation scores are consistently high, with a large majority of customers selecting scores at the upper end of the scale (9 or 10 out of 10), resulting in a Net Promoter Score (NPS) of 96.6 across the combined sample (n=596).

This pattern is observed across all three countries, although the distribution of scores shows limited variation, with very few low or neutral responses. While this may indicate strong levels of satisfaction among respondents, the concentration of high scores should be interpreted with caution. Some open-text responses suggest that customers value the service and are willing to recommend it based on perceived benefits such as improved lighting or reduced expenses.

> ***I have seen the benefit, I don't strain to charge my phone anymore***
>
> Customer in Sierra Leone

> ***SunnyMoney is the best because the other one was just a torch only.***
>
> Customer in Malawi

Figure 15 - NPS score distribution, by pilot



Net Promoter Score (NPS), by Pilot: All three pilot countries achieved an NPS rating in the "Excellent" category. Malawi (98.5) and Sierra Leone (98.5) recorded near-perfect scores, with no significant detractors. Senegal (89.1) remains very high despite 2.3% of detractors, consistent with the signs of friction regarding "value for money" identified above.

At the same time, the survey design does not allow for a detailed understanding of what drives recommendation scores or how they relate to specific aspects of the service experience. In addition, the very high concentration of positive responses may reflect response patterns that would benefit from further investigation, particularly in contexts where other indicators show more variation.

Structural factors may contribute to these high figures: surveys were facilitated in face-to-face settings which may introduce social desirability bias. Moreover, data was collected approximately four months after installation, a period typically associated with peak satisfaction before longer-term patterns stabilise; and in contexts where 86–97% of customers report no viable alternative to the service, willingness to recommend reflects in part the absence of substitutes rather than a competitive preference. Taken together, the results indicate a high stated willingness to recommend the service, while highlighting the need to further explore the factors underlying these responses and how they relate to customer experience across different contexts.

Pictured: Sun setting in Kasakula, Malawi
Photo credit: SolarAid / Kondwani Jere

6. CONCLUSION

The findings from this survey suggest that customers across the three pilots report improved access to lighting and basic energy services, with associated changes in daily routines, household activities, and perceived quality of life.

The reported changes are more pronounced in contexts where prior access to energy was limited, while in other settings, improvements appear more incremental and shaped by existing alternatives and system capacity.

Differences observed across countries may reflect a combination of contextual factors, including variations in baseline access, implementation, and customer environments. In addition, the survey does not capture long-term usage patterns or outcomes beyond the initial months following installation.

These findings provide early signals on how customers experience SHS though Energy-as-a-Service in different contexts. Further investigation, including longer-term tracking and the integration of operational and behavioural data, would be needed to better understand the durability of these effects and the drivers of variation across settings.

Pictured: Ethel Bottomani, Light a Village - Malawi
Photo credit: SolarAid / Kondwani Jere

Contact
info@realenergyaccesslab.org

Website
www.realenergyaccesslab.org

LinkedIn
@real-programme-catalyst

real.
PROGRAMME CATALYST