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LIGHTING A PATH TO AFFORDABILITY

Community members stand beside solar panels, Malawi.
Source: Efficiency for Access

Assessing the Potential of Energy as a Service to Provide Affordable First-Time Energy Access

FEBRUARY 2026

Efficiency for Access Coalition

CONTEXT

This research was commissioned to explore how the Energy as a Service (EaaS) business model could help accelerate first-time access to Tier 1 and above electricity in sub-Saharan Africa. It is the second of a two-part series of papers and builds on a separate evaluation report of the Light a Village EaaS pilot in Malawi.

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DISCLAIMER

This research is part of the Low Energy Inclusive Appliances (LEIA) programme, a flagship initiative under Efficiency for Access. Efficiency for Access is a global coalition dedicated to advancing access to energy and affordable, energy efficient appliances in low-income countries. It is a catalyst for change, accelerating access to off- and weak-grid appliances to boost incomes, avoid carbon emissions, improve quality of life and support sustainable development. LEIA is jointly managed by Energy Saving Trust and CLASP, and funded by the UK government via the Transforming Energy Access platform and the IKEA Foundation.

This report was funded by the UK government via the Transforming Energy Access platform; however, the views expressed do not necessarily reflect the UK government's official policies.

CONTACT: info@efficiencyforaccess.org

Efficiency for Access, Lighting a Path to Affordability: Assessing the Potential of Energy as a Service to Provide Affordable First-Time Energy Access, February 2026

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ABBREVIATIONS

C&I	Commercial & industrial
CAPEX	Capital expenditure
CCF	Concessional consumer financing
DRE	Distributed Renewable Energy
DSS	Demand-side subsidies
FCFA	West African CFA Franc
FMCG	Fast-moving consumer goods
KOSAP	Kenya Off-grid Solar Access Project
KPLC	Kenya Power and Lighting Company
LaV	Light a Village
LCOE	Levelised cost of electricity
MWK	Malawian Kwacha
NGO	Non-governmental organisation
OPEX	Operational expenditure
O&M	Operations and maintenance
PAYGo	Pay As You Go
PPP	Public private partnership
PURE	Productive use of renewable energy
RAR	Receivables at risk
RBF	Results-based financing
REAL	Rural Energy Access Lab
SHS	Solar home system
SHSaaS	Solar home system as a service
SLA	Service level agreement
SLE	Sierra Leonean Leone (currency)
USD	US dollar

EXECUTIVE SUMMARY

CONTEXT AND OBJECTIVES

Sub-Saharan Africa continues to face a significant energy access gap, with almost no improvement in absolute terms since 2010.

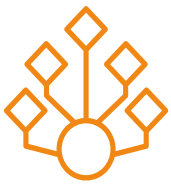
The energy access deficit is decreasing only slightly due to population growth: in 2023, 35 million people gained electricity access, but the deficit only reduced by 5 million. The electricity access deficit in sub-Saharan Africa of 565 million people is at the same level in absolute terms as it was in 2010. Sub-Saharan Africa now accounts for 85% of the global population without electricity, an increase from 50% in 2010.[1]

Concessional financing mechanisms including upfront grants, results-based finance, concessional credit lines and de-risking have helped boost access.

In Rwanda, Kenya, and Uganda, off-grid solar provides Tier 1 (and higher) electricity to 14%, 22%, and 33% of the population. Recent years have seen an increase in the types of both supply and demand side subsidies offered, and there are major commitments to funding increased access to electricity, including the recently launched Mission 300 initiative.

Nonetheless, the energy access business models and financing mechanisms used to date have only made slow progress on closing this gap.

While standalone solar systems are estimated to have reached over 560 million people globally,[2] as noted above the energy access gap in sub-Saharan Africa not only persists but has also not narrowed since 2010. Furthermore, standalone solar providers will have served the relatively more commercially viable customer segments first — those that have higher ability to pay and lower cost to serve — so closing the remaining gap will be more challenging. Indeed, affordability remains a critical challenge, with almost 80% of unelectrified households unable to afford a Tier 1 Pay As You Go (PAYGo) plan.[3]



Energy as a Service (EaaS) as a new business model could offer a valuable new toolkit.

The unserved and underserved population is still large and will not be reached by any single business model. Existing approaches have made progress but are well off track closing the gap to achieve SDG7 by 2030. EaaS is a business model in which companies provide access to an energy system and related services. Customers pay to use these services on an ongoing basis, while the company retains ownership of the assets and remains responsible for their maintenance. It represents a fresh approach, with various potential advantages (and challenges).

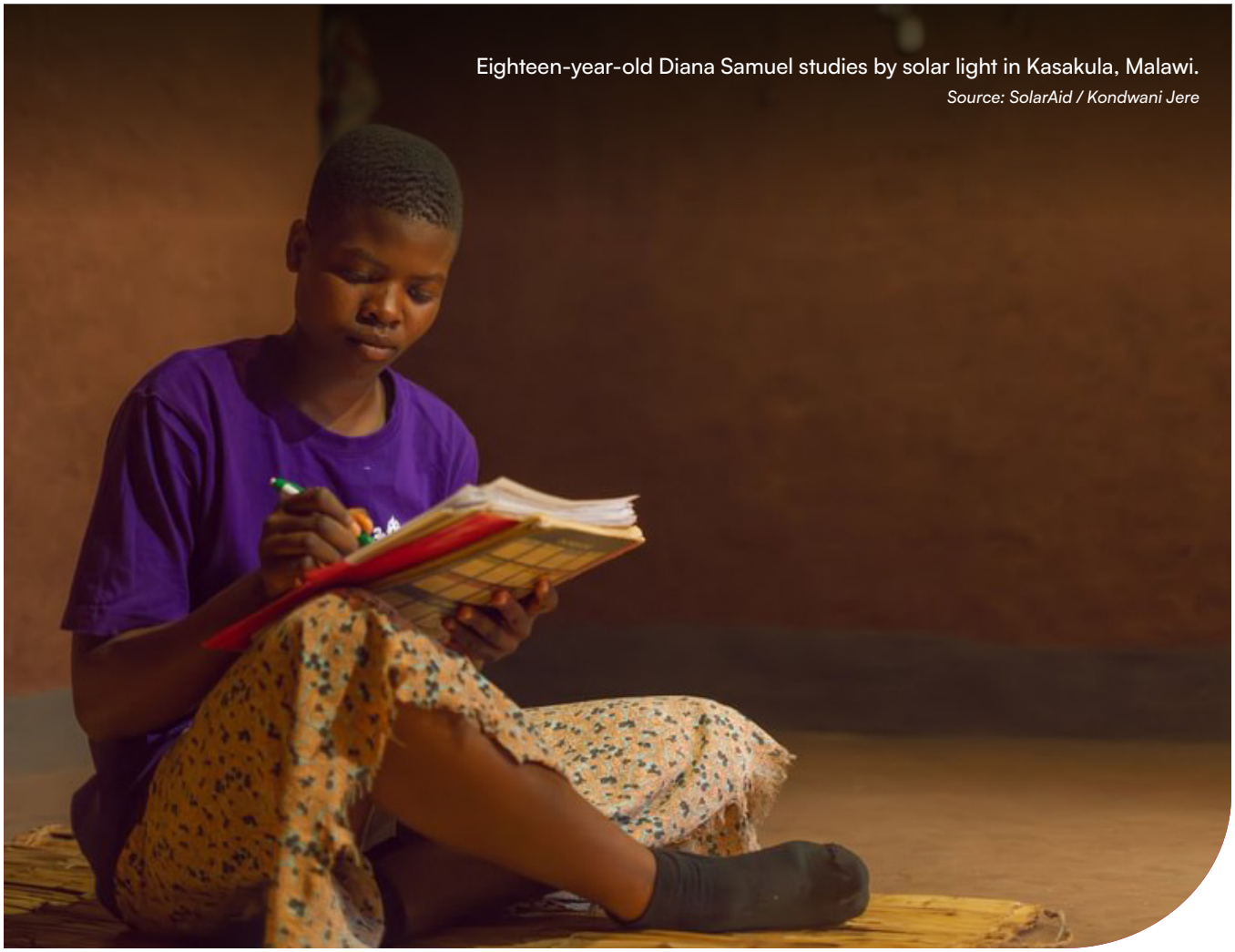
1. IEA, IRENA, UNSD, World Bank, WHO. (2025). Tracking SDG 7: The Energy Progress Report 2025. https://www.iea.org/reports/tracking-sdg7-the-energy-progress-report-2025.
2. Energy Sector Management Assistance Program (ESMAP). (2024). Off-Grid Solar Market Trends Report 2024. https://www.esmap.org/Off-Grid_Solar_Market_Trends_Report_2024.
3. Ibid.

The key value proposition of EaaS is to provide continuous long-term service, akin to how a consumer experiences in grid connected areas.

The EaaS model can replicate the core function of grid (and mini-grid) business models, with entry-level solar energy kits. Consumers receive a continuous service. Partners are responsible for maintenance and after sales servicing over a long period.

This report assesses the potential of EaaS to provide affordable first-time energy access across sub-Saharan Africa.

Its focus is on the role of EaaS to serve harder to reach customer segments, not the broader potential application of the EaaS business model, which could also be used as alternative to cash sales or PAYGo in any other market segment. The findings are based on 21 expert interviews with stakeholders with experience in or a strong interest in the EaaS business model, and build on an evaluation of SolarAid's Light a Village EaaS pilot in Malawi.



Eighteen-year-old Diana Samuel studies by solar light in Kasakula, Malawi.

Source: SolarAid / Kondwani Jere

KEY FINDINGS

EaaS offers several potential advantages which could lower the cost to serve unserved and under-served communities. First, it incentivises service providers to focus on long-term sustainability of products, not a one-off sale, which could help drive innovation to make hardware more durable and repairable. Second, by serving entire communities, it could lower unit costs through localised economies of scale. Finally, depending on how EaaS can be structured and financed, it could remove or substantially reduce the financing costs which would otherwise have to be passed on to customers.

Business models such as PAYGo are unlikely to penetrate these communities at scale, and income levels are relatively homogenous in these communities, so the risk of subsidy providers over-paying appears limited. For first-time electricity access in hard-to-reach and very low ability-to-pay communities, there is limited risk of distorting markets in the sense of providing a level playing field for different technologies and business models, nor is there a high risk of inefficient use of public funds. However, that is not necessarily the case as EaaS scales up and could present an alternative to PAYGo in general, in which case it would be important to ensure all business models are competing on equal terms, with similar structures and levels of subsidy.

A key question for the EaaS community-electrification approach is the market structure. EaaS could be supported in an open market, for example with results-based financing (RBF) programmes adapted so that both PAYGo and EaaS could compete to access funding. In this context, RBF must carefully balance the amount of funding provided upfront to EaaS and PAYGo companies against the portion tied to future results, and determine how far into the future those results should be measured. Alternatively, achieving economies of scale through greater density may require a formal or informal concession model, with a single service provider serving an entire community. This is common for utility-scale infrastructure, and has the further advantage of being able to put in place service level agreements (SLAs) potentially with an obligation to serve, and to meet minimum service levels.

The recourse mechanisms for an under-performing EaaS provider would need to be carefully considered. That is, what would happen if an EaaS operator with a formal or informal regional concession fell short of agreed service levels? In principle, the operator's contract could be cancelled and retendered, but this relies on a sufficient ecosystem of other operators who are ready and able to step in to replace underperforming operators, with minimal transaction costs. Public funders may also need the ability to monitor the EaaS operator's performance and adjust payments or retained revenue. This could include: (1) adjusting subsidy levels over time as risks beyond the operator's control evolve such as currency depreciation, cost inflation, local climate shocks which reduce customer payments; and (2) agreeing a "gain" share if the operator earns surplus returns, ensuring that part of the surplus repays some of the initial public funding.

A second important question for the EaaS business model is the operator structure. In principle, EaaS could be considered as two separate business units — an asset company (AssetCo) which retains the ownership of assets, and an operating company (OpCo) which services those assets and provides after-sales services. Customer revenues could accrue into either of the two structures, with a contract to agree flows of funds between the two based on defined key performance indicators. The extent of risk and share of over- and under-performance (on costs and on revenues generated) would need to be carefully defined, which would have implications on how each of the two business units could be financed. Separating the AssetCo could be attractive to national governments, as it allows them to retain ownership of the assets, reducing the risk of operator underperformance. It may also enable some retained revenues, depending on the contract with the OpCo, and offers a political advantage by ensuring EaaS initiatives can be fully counted towards national electrification goals.

Finally, it is important to differentiate between the different value proposition of EaaS compared to other business models, versus how those models are financed. EaaS could be funded with a full (or a high share) capex subsidy, which may mean it can avoid passing on costs associated with external finance to its customers. However, other business models could also be funded in a similar way. To ensure a level playing field and healthy competition in, or for, markets, and to make best use of scarce public funding, it will be important to innovate both on business models, and on how they can best be funded.

EaaS could potentially be a more cost-efficient way for governments to provide energy access to some customer segments, compared to PAYGo.

RECOMMENDATIONS

1. Develop more evidence on the cost-effectiveness of life-cycle servicing.

An essential proof-point for EaaS will be in deploying systems which are durable and repairable cost-effectively. This may entail innovation in hardware, designing new systems with more durable batteries and which are easier to repair, or working with upstream partners to improve the cost-effectiveness of repairing off-the-shelf systems.

2. Collect and share robust data on the evolution of costs by key cost centres as scale increases.

A key unknown is the extent of density benefits of servicing entire communities, which can generate localised economies of scale and lower operating costs per unit.

3. Test price sensitivity to determine optimal pricing.

There is a balance to strike between making energy access affordable for all, and making best use of limited public funding. Testing pricing structures and levels to explore the trade-offs between universal access while making best use of limited public funding will be important.

4. Pilot options for ensuring the interchangeability of OpCos.

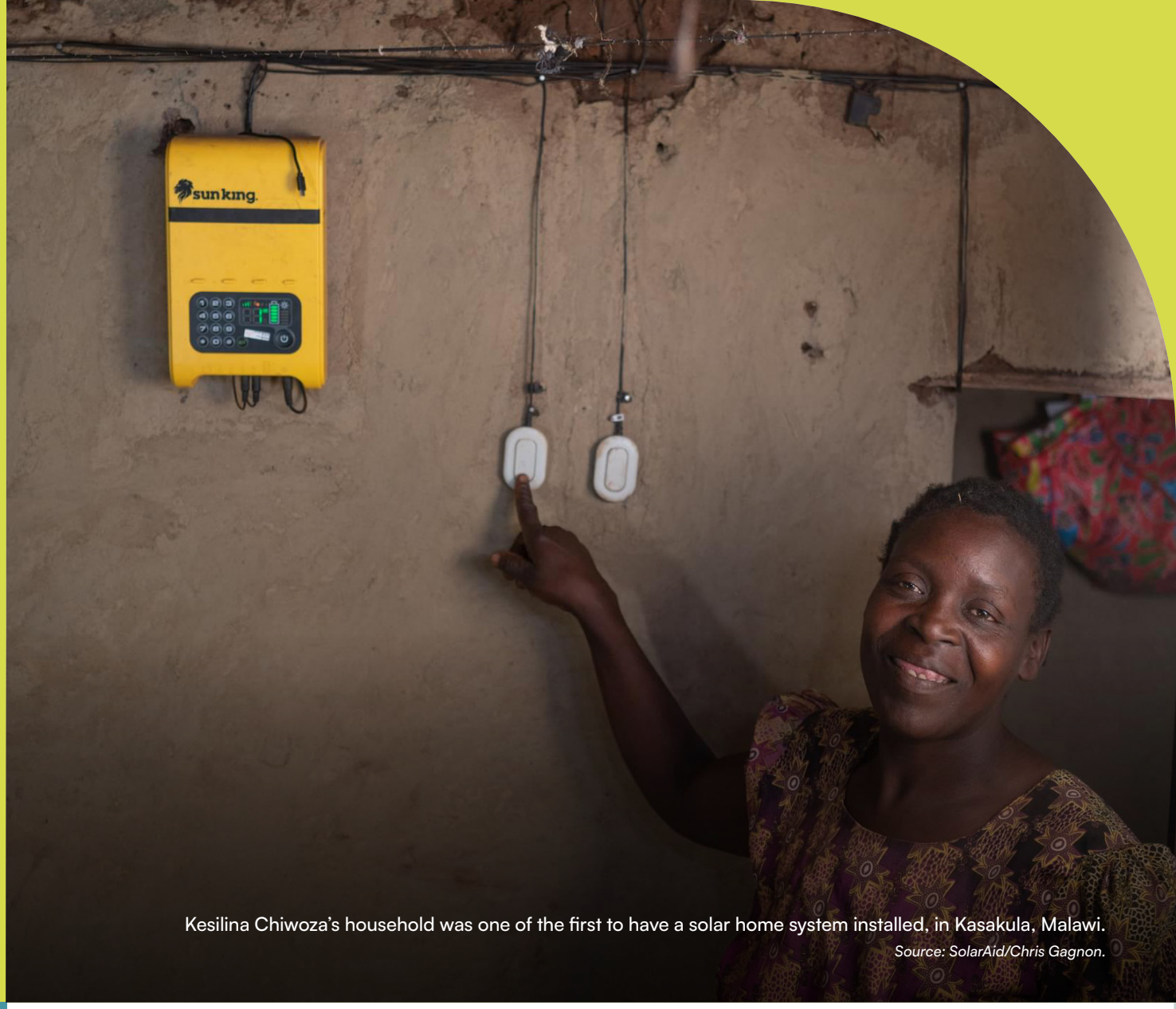
Where the EaaS provider may be the single operator for an entire community, clear governance on what happens in the case of underperformance will need to be defined, with feasible (and cost-effective) alternatives able to step in if an operator is falling below agreed service levels.

5. Clarify what type of funding or financing EaaS needs.

It is not yet clear to stakeholders interviewed for this study, what the role of different types of funders and financiers should be, at different levels of maturity of the EaaS and in different market contexts.

6. Align on key terms and on positioning.

The language around the role and objectives of EaaS are not yet consistent and may cause confusion.



Kesilina Chiwoza's household was one of the first to have a solar home system installed, in Kasakula, Malawi.

Source: SolarAid/Chris Gagnon.

1. INTRODUCTION

1. INTRODUCTION

This report evaluates the potential of EaaS to provide affordable first-time energy access across sub-Saharan Africa. It is an independent research study commissioned by Energy Saving Trust. This report accompanies and builds on evidence from an evaluation of SolarAid's Light a Village pilot in Malawi.

EaaS refers to a business model where companies provide access to an energy system and connected services, while customers pay to use those services. This is different from how most (almost all) standalone solar businesses have structured their offering to date, with upfront sales (cash, over-the-counter) or lease-to-own (PAYGo, typically over a period of 12-24 months) dominating.

This report focuses on the potential of EaaS to provide first time access and be a solution to the affordability challenge in energy access. EaaS is not in itself a new business model and is widely used in mature utility scale energy markets, as well as in the C&I and productive use of renewable energy (PURE) sector. This report focuses on how EaaS can be used for first time electricity access to the poorest and hardest-to-reach customer segments, potentially at lower cost to other business models.

The review aims to support the development of the EaaS model by programme managers, funders, policy makers, and companies. It has two objectives: (1) to present the current knowledge in the sector and perspectives of experts on the EaaS business model, and (2) to provide recommendations on how further testing of EaaS business models and financing mechanisms could be designed and scaled up in the off-grid solar sector more broadly.

The analysis answers four core research questions (RQs):

RQ1:
What is the potential role of EaaS in contributing to long-term, sustained, universal access to electricity in sub-Saharan Africa?

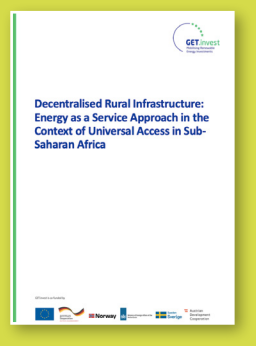
RQ2:
What should be considered to assure a level playing field and to avoid market distortion when designing financing mechanisms for EaaS?

RQ3:
What types of performance metrics would be fit for purpose for EaaS?

RQ4:
How can EaaS best be financed, and how can public funding be put to best use to support EaaS?

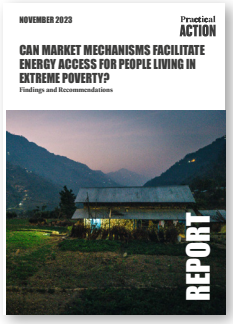
The evaluation draws on a mix of quantitative and qualitative evidence to answer these RQs. It draws primarily on 21 expert interviews on experience to date and perspectives on the future role of EaaS. Alongside these insights, it presents illustrative financial modelling comparing the EaaS business model to alternatives, particularly the PAYGo business model, if a similar level and structure of public funding were provided to each business model. It also includes practical case studies in boxes for: (1) SolarAid's Light a Village EaaS pilot in Malawi, (2) Moon's EaaS business model in Senegal, and (3) Easy Solar's EaaS scale up in cooperation with the Government of Sierra Leone in the Lite Salone programme.

It contributes to a growing literature on business models and financing mechanisms suitable for first-time electrification. This includes the selection of key publications on the following page. **A full reference list is provided at the end of this report.**



GET.Invest (2024) "Decentralised Rural Infrastructure: Energy as a Service Approach in the Context of Universal Access in Sub-Saharan Africa"

This report highlights EaaS as a promising model to overcome barriers such as high upfront costs, risk of non-functional assets after payment periods, and inadequate financing models. The report effectively recommends an "AssetCo" model, where governments and SHS providers create a structure that will deploy the initial assets (solar kits) — the AssetCo, and a separating structure that provides the ongoing servicing of those assets — the OpCo.



Practical Action (2023) "Can Market Mechanisms Facilitate Energy Access for People Living in Extreme Poverty?"

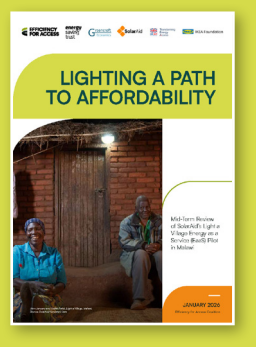
Practical Action has authored a series of reports and designed an Excel-based toolkit and model to represent the role of various business models and financing mechanisms on affordability of energy access products for people living in extreme poverty. This includes consideration of the EaaS business model, noting that it would allow more households in extreme poverty to be reached, on the basis that monthly payments can lead to less than half the size of monthly repayments required by PAYGo business models.

Energy Saving Trust (2023) "The Road to Zero Interest: The Potential Role of Concessional Consumer Financing in Energy Access"

The report explores the potential role of long-term concessional consumer financing (CCF) to accelerate uptake of energy access technologies by improving affordability, through reducing monthly repayments by spreading total repayment over a longer time period. CCF is commonly used to overcome high upfront costs and enable households to access renewable energy and energy efficiency products in advanced economies, but it has rarely been used in energy access projects in emerging economies.

Climate Compatible Growth (2025) "Current Practices in Results-Based Financing for Energy Access — a Critical Analysis of The Available Literature"

The report provides an independent review of previous publications on RBF. It fills an evidence gap in the sector, where most reports on RBF were published by donors — often to promote positive findings as part of advocacy. The literature review presents findings in three categories: programme design, programme implementation, and programme completion. It is a critical analysis of RBF and highlights that it is not a one-stop solution for providing energy access.



Lighting a Path to Affordability: A Mid-Term Review of SolarAid's Light a Village Energy as a Service Pilot in Malawi

The report evaluates the impact and potential of SolarAid's Light a Village (LaV) Energy as a Service (EaaS) pilot in Malawi and assess its ability to scale of providing first-time energy access in areas where affordability is extremely low. The LaV deep dive was published alongside this report to complement each other.

Lyness Batson's household was one of the first to have a solar home system installed.

Source: SolarAid/Kondwani Jere.

The remainder of the report is structured as follows:

SECTION 2
sets out the context of efforts to achieve universal electrification in sub-Saharan Africa, and why new toolkits will be needed.

SECTION 3
introduces the EaaS business model and explains how it could contribute to universal electrification efforts.

SECTION 4
summarises the potential role of EaaS alongside other energy access business models, to provide first time electricity access.

SECTION 5
sets out the cost structure and options for how EaaS could be designed.

SECTION 6
proposes a way to move forward on defining appropriate key performance indicators for EaaS providers.

SECTION 7
considers how the EaaS model can be financed, and how cost-effective this may be relative to other energy access business models and financing mechanisms.

SECTION 8
makes recommendations for further testing and positioning of the EaaS business model.

Luke Banda at the Light a Village project, Malawi.

Source: SolarAid/Kondwani Jere.

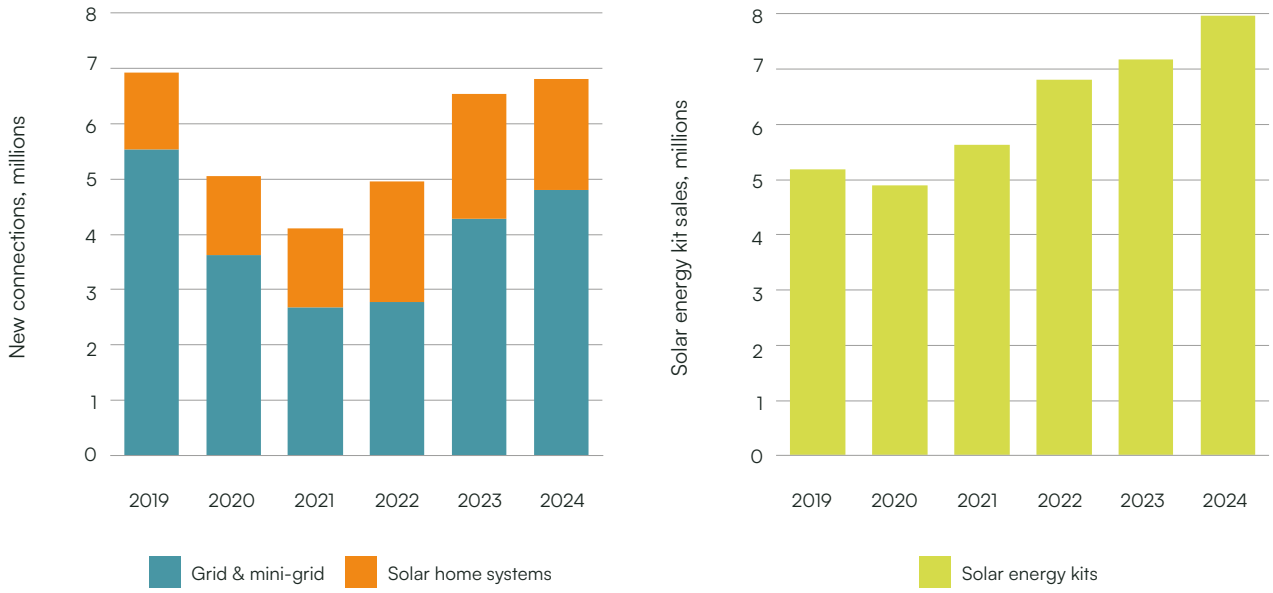
2. SUB-SAHARAN AFRICA'S ELECTRICITY ACCESS CONTEXT

2. SUB-SAHARAN AFRICAN ELECTRICITY ACCESS CONTEXT

Electricity access in sub-Saharan Africa grew from 38% in 2013 to 53% in 2023,[4] which leaves almost half of households without access. There are wide regional disparities, with Burundi, Chad, Malawi and Niger having an electricity access rate between 12% to 20%, Kenya, Ivory Coast, Cameroon, and Botswana a rate of 72% to 76% and Ghana a rate of 90%.[5] The region accounts for 85% of the global population without electricity.[6]

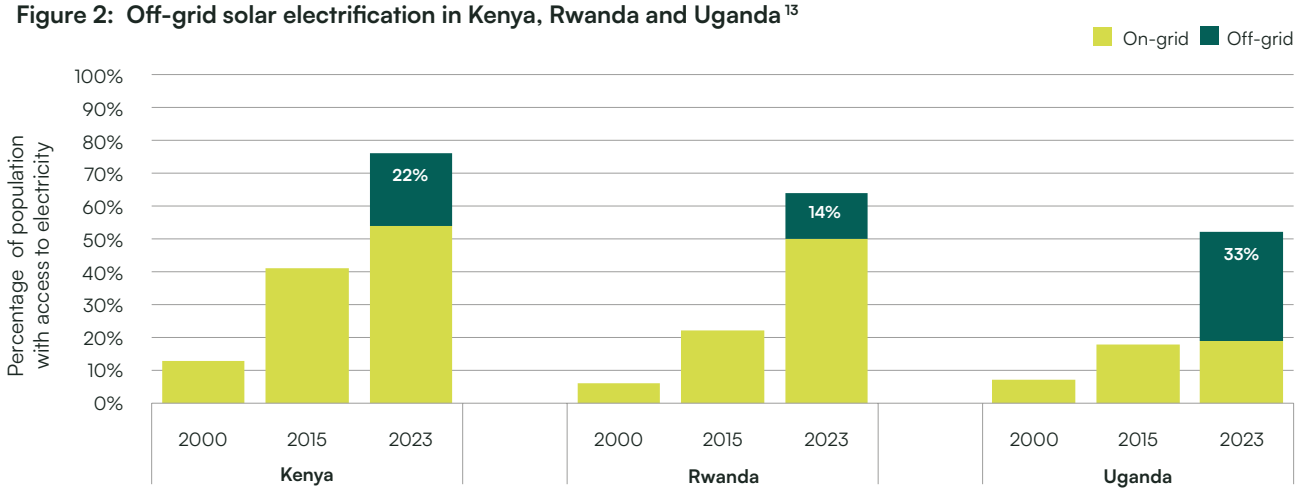
Off-grid energy technologies have played a central role in accelerating electricity access. Solar home systems provided on average 34% of the new connections in sub-Saharan Africa between 2020 and 2024, which translates to ten million new connections during this period **(Figure 1)**.[7] In some countries, off-grid energy is making a significant contribution to energy access — for example serving 22% of the population in Kenya, 14% in Rwanda, and 33% in Uganda **(Figure 2)**. In the five-year period from 2000 to 2024, GOGLA recorded sales of almost 38 million solar energy kits in the region and there is year-on-year growth.[8,9] Mini-grid deployment has also been growing in the region, where the number of installed connections almost doubled between 2019 and 2021: from 40,700 to 78,000 connections.[10]

Figure 1: New connections in sub-Saharan Africa between 2019-24 and solar energy kit sales in 2016-24[11,12]



4. IEA, IRENA, UNSD, World Bank, WHO. (2025). Tracking SDG 7: Electricity access rate. https://trackingsdg7.esmap.org/results?p=Access_to_Electricity&i=Electricity_access_rate,_Total_(%25).
5. Ibid.
6. IEA, IRENA, UNSD, World Bank, WHO. (2025). Tracking SDG 7: The Energy Progress Report 2025. https://www.iea.org/reports/tracking-sdg7-the-energy-progress-report-2025.
7. IEA. (2024). Annual electricity access in sub-Saharan Africa, 2019-2024. https://www.iea.org/data-and-statistics/charts/annual-electricity-access-in-sub-saharan-africa-2019-2024.
8. These solar energy kits encompass products ranging from solar lanterns to larger solar home systems.
9. GOGLA. (2025). Semi Annual Global Off-Grid Solar Market Reports. https://gogla.org/reports/semi-annual-solar-market-report/january-june-2025-gogla-sales-data/.
10. Mini-Grids Partnership. (2024). State of the Global Mini-Grids Market Report. https://minigrids.org/global-market-report-2024/.
11. IEA. (2024). Annual electricity access in sub-Saharan Africa, 2019-2024. https://www.iea.org/data-and-statistics/charts/annual-electricity-access-in-sub-saharan-africa-2019-2024.
12. GOGLA. (2025). Semi Annual Global Off-Grid Solar Market Reports. https://gogla.org/reports/semi-annual-solar-market-report/january-june-2025-gogla-sales-data/.

Figure 2: Off-grid solar electrification in Kenya, Rwanda and Uganda [13]



However, these gains are both not enough, and are precarious, with energy access barely increasing in absolute terms in sub-Saharan Africa. Between 2010 and 2022, population growth has exceeded new connections, and 572 million people lacked access in 2022 compared to 567 million in 2010.[14] The energy access deficit has grown even wider in rural regions, from 376 million in 2010 to 473 million in 2022.[15] In 2023, there was a slight improvement, 35 million people gained access to electricity, but population growth was 30 million, so the net electricity access gap still only fell by five million.[16]

Affordability and access to consumer financing are highlighted as the largest barriers to uptake. More than 65% of off-grid solar companies surveyed as part of a GOGLA member survey in 2024 report both affordability and access to consumer financing as significant challenges, and these barriers are exacerbated in the most remote areas. More than half of companies also reported that access to funding was a significant challenge.[17]

It is increasingly recognised that the PAYGo business model will not bridge the affordability gap for African households who do not yet have access. Many existing business models are too expensive for many communities, with an estimated 80% of unconnected households unable to afford a Tier 1 solar energy kit even with PAYGo, with this percentage higher for the most remote areas.[18] While PAYGo in principle can help make energy access products more affordable for customers at the bottom of the pyramid, low utilisation rates and poor customer credit portfolio have been persistent issues, resulting in a *"worrying loss of energy access for people and [hurting] companies' sustainability"*.[19] This is underscored in the most recent market trends report, which finds that half of companies faced a combined write-off,[20] and RAR 30,[21] of 30—50% in 2023, compared to just 18% in the same 20%—50% range in 2021; indicating significant challenges with maintaining high customer repayment rates in the PAYGo model.

Investment in the sector has reverted to a stable trend since 2016, after a spike in 2022. Overall investment in the sector dropped by 30% in 2024, following a drop of 43% the previous year.[22] Furthermore, 2024 also saw a 70% decline in start-up capital. However, total investment of just under USD300 million in 2024 is still broadly in line with historical trends which saw an average of USD320 million invested in the five years from 2016 to 2020. Two large current opportunities are the launch of the Mission 300 initiative, and an increase in results-based financing (RBF) in general, which both advocate for smart subsidies.[23]

In this context, EaaS as a new business model could offer a valuable new toolkit. The unserved market is still large and will not be reached by any single business model. Existing approaches have made some progress but are off track for closing the gap to achieve SDG7 by 2030. EaaS offers a fresh approach, with different advantages and challenges as set out in the next section.

13. IEA, IRENA, UNSD, World Bank, WHO. (2025). Tracking SDG 7: The Energy Progress Report 2025. https://www.iea.org/reports/tracking-sdg7-the-energy-progress-report-2025.
14. IEA, IRENA, UNSD, World Bank, WHO. (2024). Tracking SDG 7: The Energy Progress Report 2024. https://www.iea.org/reports/tracking-sdg7-the-energy-progress-report-2024.
15. Ibid.
16. IEA, IRENA, UNSD, World Bank, WHO. (2025). Tracking SDG 7: The Energy Progress Report 2025. https://www.iea.org/reports/tracking-sdg7-the-energy-progress-report-2025.
17. Energy Sector Management Assistance Program (ESMAP). (2024). Off-Grid Solar Market Trends Report 2024. https://www.esmap.org/Off-Grid_Solar_Market_Trends_Report_2024.
18. Ibid.
19. GOGLA. (2022). PAYGO, a driver for energy access for the bottom of the pyramid. https://gogla.org/blog/paygo-a-driver-for-energy-access-for-the-bottom-of-the-pyramid/.
20. Payments expected from customers that companies have written-off due to customer non-payment during a given period.
21. Receivables that have not been paid more than 30 days after they were expected.
22. GOGLA. (2025). Investment Data. After the Dip: Off-Grid Solar's Defining Moment. https://gogla.org/reports/investment-data-report/after-the-dip-off-grid-solars-defining-moment/.
23. Ibid.

Installation of the solar home system in customer Kennedy Buleya's house, Kasakula.

Source: SolarAid/Konwdani Jer

3. INTRODUCING THE ENERGY AS A SERVICE BUSINESS MODEL

3.1. Overview of the EaaS Business Model and Recent Trends

EaaS builds on well-established fee for service business models. EaaS is common in more developed energy markets, and for larger technologies such as productive use of energy and commercial and industrial rooftop solar. In general, fee for service business models are common across the world — users typically pay a fee-for-service for utility-scale electricity, and in some cases can also pay for energy efficient appliances under a fee-for-service model.[24]

The key value proposition of EaaS is to provide continuous long-term service, akin to how a consumer experiences a grid connection in much of the world. The EaaS model replicates the core function of grid (and mini-grid) business models, but applies it to smaller, and shorter asset-life, standalone solar kits. Consumers do not own the hardware, which remains the responsibility of their provider. In return, they receive (in principle) a continuous service, with maintenance and after-sales servicing committed by the provider over a long period.

Nonetheless, its application is relatively new for first-time electricity access using entry-level standalone solar systems. There have been some small-scale pilots of fee-for-service business models, which are described in case study boxes throughout this report. However, EaaS is yet to be financed at scale as a major part of electricity access across sub-Saharan Africa.

In energy access deficit contexts, EaaS offers an alternative model to connect hard-to-reach communities. Its initial role would be to provide First-Time, low-tier electricity access to customers which are costly to serve and/or have highly constrained ability to pay. The core principle is that the customer pays a fee to have access to energy-enabled services, rather than to own the fixed assets (solar panels etc.).

EaaS has emerged in response to growing recognition that other business models are poorly suited to reaching the poorest and hardest-to-reach communities. In the past decades, these communities have been neglected, or companies have tried to serve them through the direct sale of SHS — either cash over-the-counter or through a PAYGo lease-to-own model, often with various forms of supply and demand side subsidy. Other solutions have been mini grids, that were also often highly subsidised. It is now becoming more widely accepted that these business models are too expensive for many communities, with an estimated 80% of unconnected households unable to afford a Tier 1 solar energy kit even with PAYGo. This percentage can be higher for most remote areas.

The EaaS concept for first-time electrification is gaining in traction, with several new initiatives seeking to scale up and build evidence around the business model. As described in **Box 1**, the REAL Programme Catalyst has been set up to further develop and scale up deployment of the EaaS model, including recently receiving €500k of support from the Nordic Development Fund to develop rural "pre-grid electrification programmes" through EaaS in 10 African countries.[25] EnDev is also financing EaaS pilots through its "Innovation Window 2025-2026", including in Niger and Uganda. The +Energia facility in Mozambique has also opened an RBF window dedicated to the EaaS business model.[26]

24.IRENA. (2020). Energy as a Service: Innovation Landscape brief. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jul/IRENA_Energy-as-a-Service_2020.pdf.

25. NDF. (2025). Supporting REAL clean energy solutions in Africa with an NDF Booster Grant. https://www.ndf.int/newsroom/supporting-real-clean-energy-solutions-in-africa-with-an-ndf-booster-grant

26. +Energia. (2025). Results-Based Financing (RBF) Funding Window 2: Energy-as-a-Service. https://maisenergia.co.mz/wp-content/uploads/2025/06/RBF-EaaS-DRE_Call-for-Proposal-1_v01.pdf.

BOX 1: RURAL ENERGY ACCESS LAB (REAL) — A CONSORTIUM DRIVING EAAS[27]

Originating from the Rural Energy Access Lab, REAL Programme Catalyst is an independent not-for-profit partnering with governments and development organisations to fast-track scalable, affordable and sustainable Solar Home System as a Service (SHSaaS) programmes in rural sub-Saharan Africa. Income for Kasakula's households is highly seasonal and volatile.

REAL Programme Catalyst's SHSaaS model deploys solar home systems as infrastructure, using a service-based approach to connect the largest number of remote populations to long-term, foundational energy access at the speed required to achieve SDG7. This approach emphasises sustainable strategies to ensure long-term affordable access and financial operations. It also aims to minimise e-waste, promote products that are built to last, and strengthen local operators' capacity.

Currently, three SHSaaS pilot programmes have reached over 15,000 households. These pilots are operated by REAL Programme Catalyst's three co-founders: Easy Solar in Sierra Leone (2,100 connections installed, 10,000 to be reached by Q1 2026; at penetration rates between 88% and 100%), Moon in Senegal (3,525 households in 50 Senegalese villages, with more than 80% penetration rate; and over 2,000 households in Madagascar, in partnership with a mini-grid developer ANKA), and SolarAid's Light a Village pilot in Malawi (8,816 households - 100% electrification of the Kasakula Traditional Authority). REAL Programme Catalyst secured initial scale-up funding,[28] with an explicit focus on proving the core tenets of the SHSaaS model: affordability, sustainability, and speed. It is monitoring and supporting the programme operations, using the insights to develop a SHSaaS programme blueprint.

REAL Programme Catalyst is now scaling up in a second phase, to pilot and prove viable SHSaaS business models in multiple countries and develop sustainable Assetco-Opco structures to facilitate national level scaling. REAL Programme Catalyst aims to mobilise USD200m in funding to connect 10+ million people in multiple countries by 2030; at USD100 per connection.

There is not yet consensus around how the role of the EaaS business model should best be described. Some stakeholders refer to it as "pre-grid electrification" which suggests Tier 1 electrification that can be deployed quickly, but that has a temporary character until countries are fully electrified by mini-grids. However, other stakeholders prefer different labels. They do not view energy access as a binary choice such as 'grid' and 'not-grid' (or 'pre-grid'). This is because the quality of grid connections varies greatly, as do the quality and tier[29,30] of off-grid energy access.

The EaaS business model may also be appropriate for a range of settings, including where the grid is indeed expected to arrive in the next five — 10 years, and cases where it may be well more than a decade before those customers are likely to get a grid connection.

27. Case study provided by REAL Programme Catalyst. https://www.realenergyaccesslab.org/.
28. NDF. (2025). Project Database: Real Energy Access Lab (REAL). https://www.ndf.int/what-we-finance/projects/project-database/real-energy-access-lab-real-c175.html.
29. The ESMAP tiers of energy access are now commonly used to set out differences in energy access level, starting with an entry-level lighting system with at least 3-Watt peak capacity (Tier 1) up to a reliable connection with at least 2 kW capacity (Tier 5).
30. ESMAP. (2015). Beyond Connections: Energy Access Redefined. https://www.worldbank.org/content/dam/Worldbank/Topics/Energy%20and%20Extract/Beyond_Connections_Energy_Access_Redefined_Exec_ESMAP_2015.pdf.

> "I don't like the term pre-grid electrification; it's already a form of electrification which should be valued in its own right; electrification is a continuum, and we should be fine with that."
>
> **[FINANCIER]**

3.2. Situating EaaS relative to other energy access business models

EaaS works more like mini-grids or utility-scale power: customers pay a perpetual fee for access to services. The energy service providers retain ownership of the assets, with a commitment to provide customers with long-term energy access services. This is like major infrastructure approaches such as mini-grids and utility scale electricity networks, which typically charge a user on a fee-for-usage basis, often with a separate initial connection charge.

Across Europe and in North America, electrification embeds cross-subsidised and preferential tariffing to serve the hard-to-reach and low ability-to-pay. Electricity grids typically do not require hard-to-reach customers to pay the full cost of service. Instead, they build in cross-subsidies as part of a universal obligation for service. Similarly, many utilities offer "affordability" or "lifeline" type tariffs to make sure a minimum level of electricity access is affordable to all. However, since these are covered by the service fees paid by other customers, or with government subsidies, they are most feasible where there is a high share of relatively lower cost-to-serve, and relatively higher ability-to-pay customers, or where government can raise substantial fiscal resources.

It is challenging for electricity utilities or governments to raise the funds required to embed cross-subsidisation for electricity access. This explains why such approaches are not mainstream across sub-Saharan Africa, where energy utilities often still have low connection rates, and are loss-making, unable to cover existing costs from customers. [31] Nonetheless, an innovative example was trialled in the Kenya Off-grid Solar Access Project (KOSAP), which piloted a cross-subsidisation approach, where national utility KPLC charges customers an extra 0.3 USDc/kWh to cross-subsidise rural mini-grids connections.[32]

Where EaaS differs from mini-grids and utility-scale solar is that the entire asset is located on the customer's site. Part of the rationale for fee-for-service in mini-grids and utility-scale transmission and distribution networks is that they rely on shared infrastructure. These costs are not tied entirely to a single customer and are instead recovered across all customers. This is not the case with standalone solar systems, where all the physical infrastructure sits on the customer's property, although they may be redeployed (at a cost) if a household is no longer using their system. This difference has meant that asset ownership-based models have been possible as an alternative — in much the same way that in Europe households tend to own most of the appliances and furniture that is in their home and is not shared with other households. EaaS also offers only lower tier energy access, where a full grid connection can add potentially unlimited household electrical appliances.

> "If you restrict EaaS to those who can least afford it, it won't work only serving the hardest-to-reach and lowest ability to pay. We don't do that in grid — where there are cross-subsidies."
>
> **[OFF-GRID SOLAR PROVIDER]**

31. ESMAP. (2022). Designing Public Funding Mechanisms in the Off-Grid Solar Sector. https://documents1.worldbank.org/curated/en/099300005162263450/pdf/P175150067776e102308e980bb2d798ca5c3.pdf.

32. Tearfund. (2020). Designing sustainable subsidies to accelerate universal energy access. https://learn.tearfund.org/en/resources/policy-reports/designing-sustainable-subsidies-to-accelerate-universal-energy-access.

In the case of entry-level, first-time electricity access, an attraction of the EaaS model is to lower the monthly cost of electricity access. The EaaS model may be able to reduce costs for the end-user by:

Removing the initial capital costs — if these could be substantially or entirely subsidised.

Lowering costly working capital costs to bridge the gap between the upfront costs of deployment and customer revenues collected over time (or in the case of 100% capex subsidy, avoiding these costs entirely).

Lowering unit costs, by achieving high penetration rates when seeking to serve entire communities, and unlocking economies of scale.

Through these cost-reducing, and revenue-boosting approaches, the EaaS model may be able to reduce costs to end users. These levers, combined with spreading payments over a longer (indefinite) time-horizon, EaaS could work out at a monthly cost of USD2-4 per customer per month, compared to an equivalent PAYGo cost of USD8.50 per month.[33,34]

Figure 3: The advantages and disadvantages of the EaaS business model

	PROVIDER	END USERS
+	Bulk procurement may lower cost of acquisition of systems Reduced opex through density effect of high penetration rates Continuous, predictable, long-term revenue streams to match to opex	Spreads costs over long period — reducing cost-per month Received guaranteed continuous service level, and e-waste sustainably managed Providers are incentivised to innovate and provide high-quality, long-term services Can use system as much or as little as desired
−	High initial capital costs of deployment need to be subsidised, or recovered over many years To enhance usage, customer fees may not be sufficient to cover opex / generate profit	May increase total fees paid over long-term, as payment perpetual (never own the asset) Reliant on single service provider which may limit choice, and may limit ability to move up the energy ladder

33. GET.invest. (2024). Decentralised Rural Infrastructure: Energy as a Service Approach in the Context of Universal Access in Sub-Saharan Africa. https://www.get-invest.eu/wp-content/uploads/2024/11/GET.invest_Decentralised-Rural-Infrastructure_EAAS-_202410-6.pdf.

34. Practical Action. (2023). Can Market Mechanisms Facilitate Energy Access for People Living in Extreme Poverty? Part 2 — The Role of Market Interventions and Business Models. https://infohub.practicalaction.org/server/api/core/bitstreams/ca5aa5f1-8476-417e-ba68-137912269b8d/content.

3.3. Differentiating features of EaaS compared to cash or PAYGo

3.3.1. How the business model is structured

There are, broadly speaking, three business models that could be used for standalone solar systems:

Cash sales with the full cost paid by the customer upfront.

PAYGo, a lease-to-own business model, with an initial deposit and then a limited-period repayment of typically one — two years.

EaaS, with no upfront cost, followed by monthly payments in perpetuity.

The three models sell the same hardware — with PAYGo and EaaS incurring additional costs compared to cash sales. PAYGo and EaaS require the standalone solar systems to include remote lock-out and activation technology, and regular customer payment systems, which cash sales avoid. Otherwise, the hardware costs are similar across all three business models, although EaaS may encourage development of more sustainable products that are cheaper over the longer term (although possibly more expensive upfront, e.g. with longer life batteries).

PAYGo and EaaS help improve affordability by lowering the upfront cost, in return for a higher total payment spread over time. Cash sales may deter many customers who do not have the USD50 upfront to purchase a system. PAYGo and EaaS address this affordability (liquidity) constraint, by allowing customers to spread their payments over time. However, the customer ultimately ends up paying more, as in both the PAYGo and the EaaS models, the provider needs to cover much higher external financing costs, and customer non-payment risk.

EaaS offers the best long-term service to customers; since the company retains ownership of assets, it is responsible for making sure they continue to work. In their most reduced form, cash sales provide no after-sales services, and PAYGo only as long as customers are repaying; after which customers no longer pay. Once systems cease working, customers need to purchase a new product.

For cash and PAYGo, extended warranties could prolong the period over which customers can use their systems. It is common for cash and PAYGo providers to commit to a (limited) warranty period, in the case of PAYGo this is typically two — three years for entry-level solar energy kits, rising to five — seven years for larger solar home systems models. In both models, providers could be required (or could choose to offer) longer-term warranty services, although this may either result in increasing the cost of the systems, or a separate optional warranty fee. This is how white goods are typically purchased in Europe or North America, with the full price paid upfront, and a separate warranty purchased by the customer to guarantee repair or replacement for several years.

An advantage of EaaS is that it could set up a network of repair and e-waste disposal that might otherwise not exist. Unlike white goods in Europe and North America, there is not a competitive market for electronic good repairs and end of life disposal in much of rural sub-Saharan Africa. It may therefore be challenging to offer an extended warranty on PAYGo or cash sales in practice. EaaS providers would need to set up such an ecosystem for the business model to work effectively; a major advantage of the model, but also potentially at significant additional cost.

Figure 4: Comparing cash, PAYGo, and EaaS business model attributes

	Cash sales	PAYGo	EaaS
INITIAL CUSTOMER PAYMENT	**100% paid upfront by customer** if 100% capex subsidy, converges to free handouts	**Typically 20% deposit** to reduce financing costs and improve customer selection to those most able to keep paying. If 100% capex subsidy, PAYGo becomes equivalent to paying for after sales services (opex) during warranty period	**0% or nominal fee** customers access systems at little to no upfront cost, to maximise accessibility and high penetration within communities If 100% capex subsidy, customer payments go towards operating costs
ONGOING CUSTOMER PAYMENT	**None,** OR Could envisage payment options for warranty services	**Remaining 80% over one — two years** Repayment period can be extended, but raises financing costs and risks, and some evidence of customer payment fatigue. Opex over the warranty period	**100% of costs over 10+ years** Customers continue to pay, with the initial costs of deployment spread over 10 years (if not fully subsidised). Opex and costs of repairs / replacements paid in perpetuity
LONG-TERM SERVICE PROVISION	**None** customers purchase new system when old one needs replacing OR Warranties to guarantee X years of service	**Medium (three — five years)** Warranties provided typically up to two — three years for entry level systems and five years for larger systems Could possibly be extended, at further cost to customers	**High (10 years +)** Ongoing service guaranteed by providers, which also takes care of repairs and end-of-life e-waste disposal
OVERALL SYSTEM COSTS	**Minimal** Hardware cost only — no remote lock out tech / software required	**High(er)** Hardware needs to incorporate remote lock-out and security, and needs regular payment interfaces, and after sales customer service. May also require e-waste responsibilities	**High(er)** Hardware needs to incorporate remote lock-out and security, and needs regular payment interfaces, and after sales customer service. May also require e-waste responsibilities. Systems may be designed for longer term durability and repairability
FINANCING COSTS	**Low** revenues collected immediately, no customer repayment risk, limited working capital costs	**Medium** External financing costs limited by both (1) some upfront deposit, and (2) short repayment periods	**High** External financing costs high unless 100% initial deployment is subsidised, as financiers recover revenues over 10-year period, bearing inflation / currency depreciation risks
CUSTOMER FEES	**Lowest overall** High upfront, lowest overall	**Medium** Spreading payment lowers the initial cost to customers, but raises total cost over the full repayment by customers	**Highest overall** No upfront cost, and potentially low monthly (if subsidised) fees. But, on a like-for-like public funding basis, highest cost overall as payments over longer period (for long-term service), although may also successfully provide long-term service provision where other business models do not

3.3.2. How energy access business models are financed

A second consideration is how each of the three main energy access business models is financed.

Broadly speaking, each of the business models could be financed in the same way — the financing mechanisms are not unique to each business model. As discussed briefly in **Figure 4** for example, an up-front "capex" subsidy could be applied to any of the business models.

However, when and how public subsidies are used may vary across each of the business models:

Up-front grants — "capex subsidy":

can be used for any of the three business models, to buy down the initial cost of access for customers. The advantages of this type of funding are: (1) it can be deployed quickly by funders who want to disburse funds, (2) it reduces the financing requirement that companies have to raise from debt or equity investors. At a 100% capex subsidy, cash sales effectively become procurement and free distribution, while PAYGo converges to EaaS.

Ex-post grants — "results-based finance":

where funding is provided over several milestones, based on continued service provision. This makes most sense for PAYGo or for EaaS, and may need to reflect the length of the payment or warranty period; for both PAYGo and EaaS could be many years after the initial deployment of a system. The advantage of this is that it incentivises not only the initial customer acquisition but ensures long-term service provision. The downside is that as companies only receive the RBF (many years) after deploying systems, they need to raise external finance to bridge the gap between incurring the cost of deploying the system and receiving the RBF milestone-based funding.

Concessional finance:

can help reduce the cost of external finance companies have to raise, through various mechanisms (e.g. subsidised interest rates, subsidised currency hedging, guarantees, etc.). The value of such finance depends on how much external finance a company needs to raise — i.e. taking into account:

(1)
how long a delay there is between incurring the costs of deploying systems and recovering those costs through revenues, and

(2)
the risk of customer non-payment that may affect revenue streams,

(3)
external factors that may affect the value of deferred revenues, such as inflation and currency depreciation.

The more public funding is provided upfront, the lower the external financing costs are. However, this also requires public funding to be available at large scale upfront to finance the acquisition and installation of systems, and to be willing to bear the risk that service providers (PAYGo or EaaS) may not succeed in providing continued service provision cost-effectively (without further need for subsidies. A high (up to 100%) capex subsidy is attractive for customers and service providers alike but is expensive and risky for the funder.

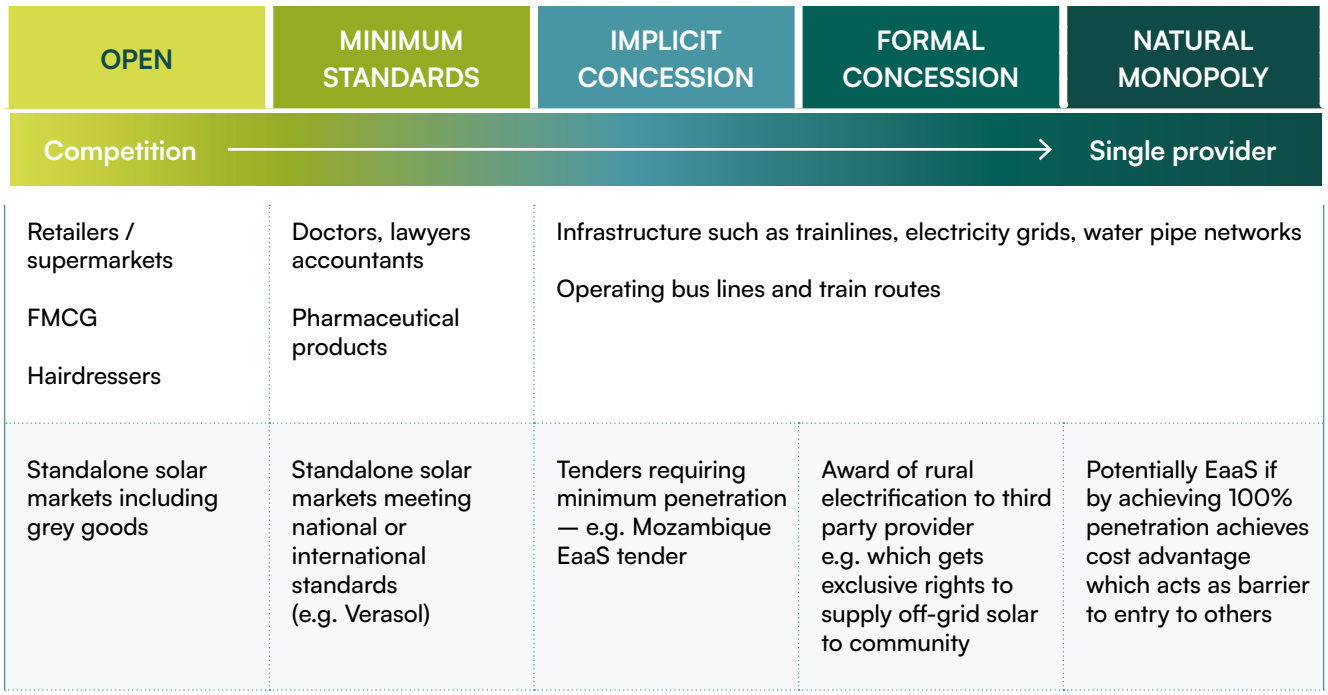
Public funders will want to leverage their limited resources to mobilise private sector investment. Raising private finance means public funders can make their money go further, achieving higher impact than they would be able to on their own. External investment could be raised to finance either (or both) of the initial deployment of systems or the ongoing operations to serve customers. In both cases, sufficient revenues would need to be generated to provide a rate of return to financiers.

3.4. Competition versus single provider in EaaS models

There are a range of ways that EaaS markets could be structured; from open competition through to a regional monopoly with a single service-provider.

As set out in **Figure 5**, standalone solar business models can span the full spectrum from open competition through to institutionalised monopolies through concessions, or natural monopolies through creating barriers to entry.

Figure 5: Competition versus single service provider for EaaS



Open competition is attractive if there are there are sufficient operators competing such that customers can make well informed decisions trading off the price and quality of goods and services offered. Open competition requires that there are relatively limited barriers to entry, such that firms can enter and compete. If an incumbent firm is making excess profit, this should attract other firms to enter and offer lower prices or a higher level of service, such that consumers benefit from competitive pressures on both price and quality. This is the case for example for fast-moving consumer goods, such as soap, food products etc. In energy access settings this could be the case in regions where there are no quality standards, and any company can offer the technology, price, and payment plan that they think will be most attractive to customers.

Minimum standards are a common regulation that limits completely free competition to safeguard consumers. Many markets have at least some forms of regulatory minimum standards which are in place to make sure that consumers receive acceptable products and are not exposed to providers who offer low prices but then do not deliver sufficient quality. The argument for such regulation is that it is hard for consumers to be fully informed prior to purchase on the quality of a provider — for example to practice medicine or law typically requires formal certification. This is the typically also the case for white goods which must meet defined safety and performance standards. It is common in energy access markets where either national or internationally recognised (e.g. Verasol) product safety and performance standards must be met.

Finally, some markets tend towards, or are formally allocated to, single service providers. This occurs where a free market would tend naturally to favour a single service provider, where there are high barriers to entry. The classic example is network infrastructure, where once one incumbent has put in place a capital-intensive physical network, it would be inefficient for competitors to install duplicates of that network (e.g. telecommunication lines, gas pipelines, electricity transmission lines, etc.). Energy access markets may share some characteristics of a natural monopoly, to the extent that the economies of scale from servicing an entire community are large, so the cost of a single service-provider providing last mile energy access to all households in a community may be lower than if multiple service providers divide up service provision within the same community.

Utility-scale electricity provision is perhaps the best-known example of a natural monopoly, particularly for transmission and distribution infrastructure. However, this does not seem to characterise off-grid solar, which is closer in likeness to fast-moving consumer goods (FMCG) retail markets — which tend to be highly competitive. However, as mentioned above, if the operating costs associated with serving an entire community exhibit sufficiently strong economies of scale, that could make EaaS akin to a natural monopoly, where no new entrant would be able to compete on cost with an incumbent that had achieved high concentration rates. One way around this may be product differentiation, with competitors offering higher tier products (unless of course the EaaS provider also offers a range of products).

There are examples of a concession-type approaches to rural electrification using third-party off-grid providers in Latin America. In Peru, the government allocated off-grid solar concessions, awarding energy service providers the exclusive right — and obligation — to supply designated communities, charging a regulated tariff. Acciona installed and maintained solar home systems on a fee-for-service model, covering the costs predominantly through a cross-subsidy amounting to almost 80% of a pre-defined tariff of USD17 per month.[35] The subsidy covered installation, while fees from end users covered the operation and maintenance costs.[36] A similar scheme has been set up in Mexico (also implemented by Acciona), again using a public private partnership (PPP) type approach with government subsidising 50% of the cost of installation of the system , and customers paying the remaining 50% from their savings (around USD104). The remaining programme costs are covered by Acciona and the Spanish Agency for International Development Cooperation AECID.[37]

Even where a single service provider is appointed, there can — and should — be a competitive process for the market. While open competition relies on competition in the market to generate price and quality competition to the benefit of end users, a single-provider market can seek to achieve similar results with competition for the market. This is done through competitive procurement processes and could include for example elements of a reverse auction process where applicants compete by bidding on the per-unit subsidy needed.[38]

35. Alliance for Rural Electrification (ARE). (2016). Fundacion ACCIONA Microenergia — Light at Home: Providing basic electricity services with SHS (Peru). https://www.ruralelec.org/case-study/fundacion-acciona-microenergia-light-home-providing-basic-electricity-services/.

36. Eras-Almeida, Andrea; Vasquez, T.; Hurtadi, M.J.; Egido, M. (2020). Evaluacion de sistemas solares fotovoltaicos aislados y sus esquemas de sostenibilidad en las Zonas No Interconectadas de Colombia. https://www.researchgate.net/publication/345771205_Evaluacion_de_sistemas_solares_fotovoltaicos_aislados_y_sus_esquemas_de_sostenibilidad_en_las_Zonas_No_Interconectadas_de_Colombia.

37. Inter-American Development Bank (IDB). (2016). Sustainable Energy Distribution in Latin America: Study on Inclusive Distribution Networks. https://publications.iadb.org/publications/english/document/Sustainable-Energy-Distribution-in-Latin-America-Study-on-Inclusive-Distribution-Networks.pdf.

38. As for example has been used by the Beyond the Grid Fund for Africa to award RBF to its energy service providers.

BOX 2: RURAL ELECTRIFICATION USING EAAS— A CASE STUDY FROM SENEGAL[39]

Casamance is an agricultural region in the south of Senegal. Moon implements a programme which is aimed at providing access to energy to households, living in unelectrified rural areas, by providing them with Solar Home Systems (SHS).

This rural, decentralised pre-electrification programme is based on a commercial model that sells energy through an EaaS model. The energy comes from prepaid SHS from Moon. Through this method 3,525 households have gained access to electricity. Another 2,500 connections will be realised in the coming months (expected before the end of 2025, at the time of writing).

The biggest advantage of EaaS is that solar home systems become affordable. There is no upfront connection fee and only pay for actual usage. The EaaS model provides households with a three or five light solar energy kit, with a USB charging point to charge phones or radios. This costs around USD4.29 (FCFA 2,500) per month.

Moon remains responsible for the performance of the product, leveraging innovative software as well as sustainable and repairable batteries and components. Users benefit from long-term service, after-sales client services available and local presence.

For investors, it is important to gain a full understanding of the details of EaaS. This requires transparency on usage data, details on repairs and replacements etc. Moon has set up a monitoring platform to collect these data and translate these into KPIs like penetration rates, payment rates, churn rates or failure rates.

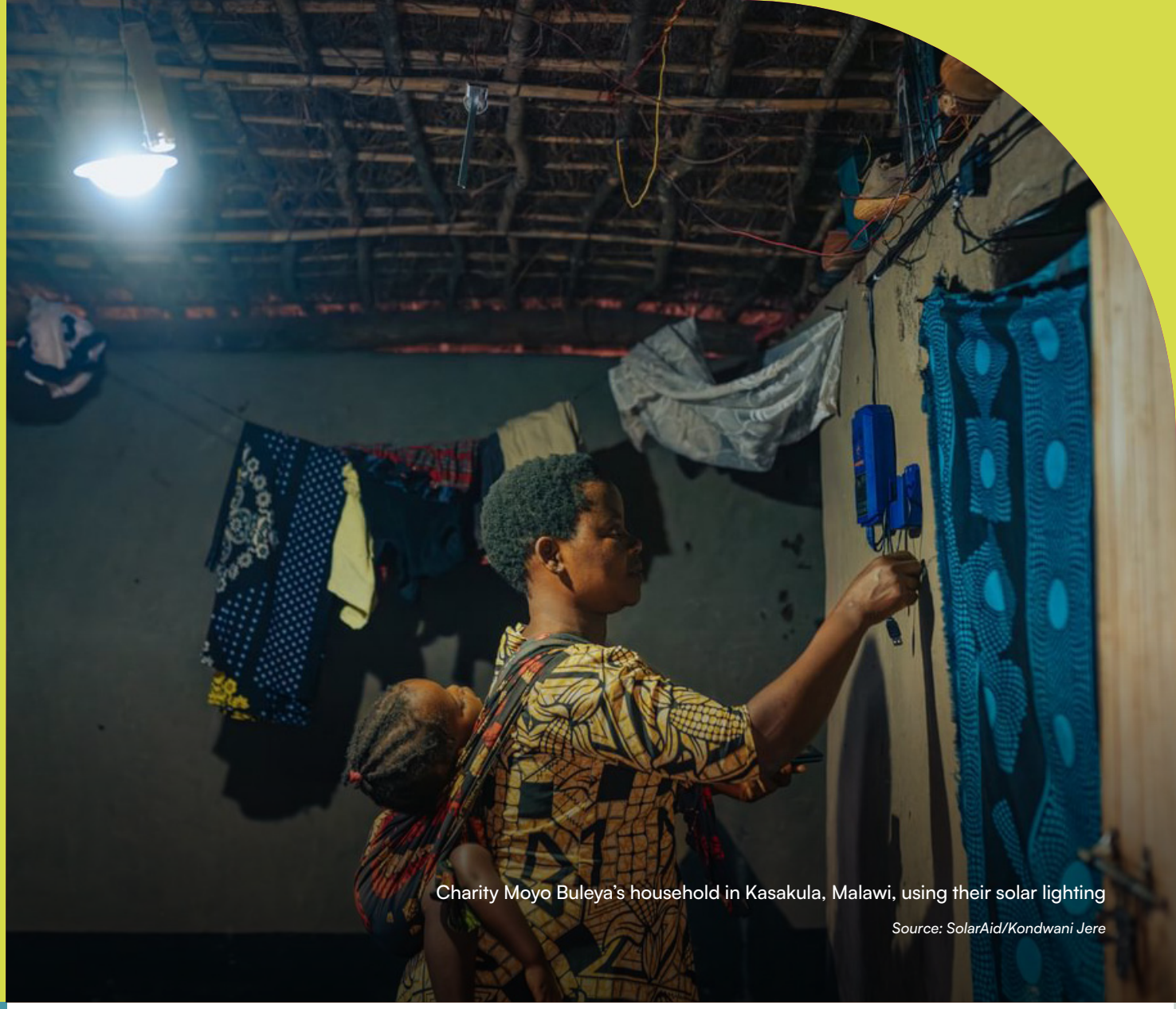
Since the start of the programme, 3,525 households have been connected, with a penetration rate of up to 81%. Around 95% of the connected households actively use the system, with a very limited number of repossessions. Non-payment rates are low, with 92% of the users stating that their monthly energy bill is lower than before, when using alternative energy sources.

Since the start of the programme, **3,525 households** have been connected

with a penetration rate of **up to 81%**

92% of the users stating that their monthly energy bill is lower than before, when using alternative energy sources

39. Case study provided by REAL Programme Catalyst, which partially funded and continues to support the operations of the programme.



Charity Moyo Buleya's household in Kasakula, Malawi, using their solar lighting

Source: SolarAid/Kondwani Jere

4. THE POTENTIAL ROLE OF ENERGY AS A SERVICE

IN FIRST-TIME ELECTRICITY ACCESS IN SUB-SAHARAN AFRICA

4.1. Serving the hardest-to-reach and lowest ability-to-pay

It is increasingly clear that existing energy access business models are not progressing quickly enough at reaching the poorest and hardest-to-reach. As set out in **Section 2**, there is a long way to go in achieving universal electrification and a significant risk that many African communities are left behind. Business models seeking to generate commercially sustainable (profitable, privately financed) companies are not serving these customer segments at scale, and are unlikely to in the near-term.

There is growing recognition that financing mechanisms such as RBF have not yet proved effective at reaching these customer segments at the scale needed. Most RBF programmes have focused on supporting sustainable commercial market growth and have not explicitly targeted the poorest or hardest-to-reach customers. Today, there are several demand- and supply-side RBF programmes that aim to incentivise energy service providers to serve these groups. There have been notable successes — for example Rwanda's Pro-Poor programme reached 22,000 households of which 71% were in the poorest national income classification.[40] However, the sustainability of RBF seeking to reach these types of communities is yet to be proven, with a substantial risk that customers will be unable to afford to purchase their next system without ongoing subsidies and repeated rounds of RBF. There is no firm evidence to date on what design is most effective in reaching, and providing sustained long-term energy access, to the poorest and hardest-to-reach communities.[41]

It is clear new toolkits will be needed if universal access is to be achieved — and EaaS could offer an alternative to what has been tried over the past 20 years. There is a large remaining unserved market in which EaaS could be piloted and scaled up, and it should be possible to do so while managing any potential risk of distorting commercial and near-commercial markets suitable for other business models.

> "In rural communities, unsubsidised SHS you might reach 20% to 30% in communities close to a main road. But you won't get anywhere near 100%."
>
> **[OFF-GRID SOLAR PROVIDER]**

> "It is now clear that market-based approaches are not reaching everyone; especially in less mature markets (e.g. Niger, Liberia)."
>
> **[DEVELOPMENT PARTNER]**

> "The lesson from RBF programmes is that the PAYGo companies, if they do well, are targeting relatively better off people — they are not going to reach the hardest-to-reach and low income, bottom of the pyramid."
>
> **[FINANCIER]**

> "EaaS is a good near-term solution for people who are still being left out."
>
> **[FINANCIER]**

40. GOGLA. (2024). EnDev's Pro-Poor Results Based Financing in Rwanda. https://gogla.org/wp-content/uploads/2024/11/case_study-_endevs_pro-poor_results_based_financing_in_rwanda_.pdf.

41. Climate Compatible Growth (CCG). (2025). Current Practices in Results-Based Financing for Energy Access: A Critical Analysis of The Available Literature. https://climatecompatiblegrowth.com/wp-content/uploads/REPORT-Current-Practices-Energy-Access_250619-1.pdf.

Several stakeholders expressed a concern that if EaaS is used effectively to work from the bottom-up — starting with the poorest and hardest-to-reach — it is being set up such that it canot succeed commercially or raise commercial finance. Serving only the lowest ability to pay customers in the costliest to serve regions will make it very difficult for energy service providers to cover their costs — and this remains a real challenge for the EaaS business model as it has for PAYGo and cash sales. If EaaS only serves the poorest and hardest-to-reach, it is not clear how it can be structured to leverage limited public sector funding for subsidies, while mobilising private investment which expects a rate of return to be generated. It should also be noted that EaaS could be an alternative to PAYGo for other (more commercially viable) customer segments — and some companies have indeed offered EaaS (or very long-term PAYGo) to customers on commercial terms.

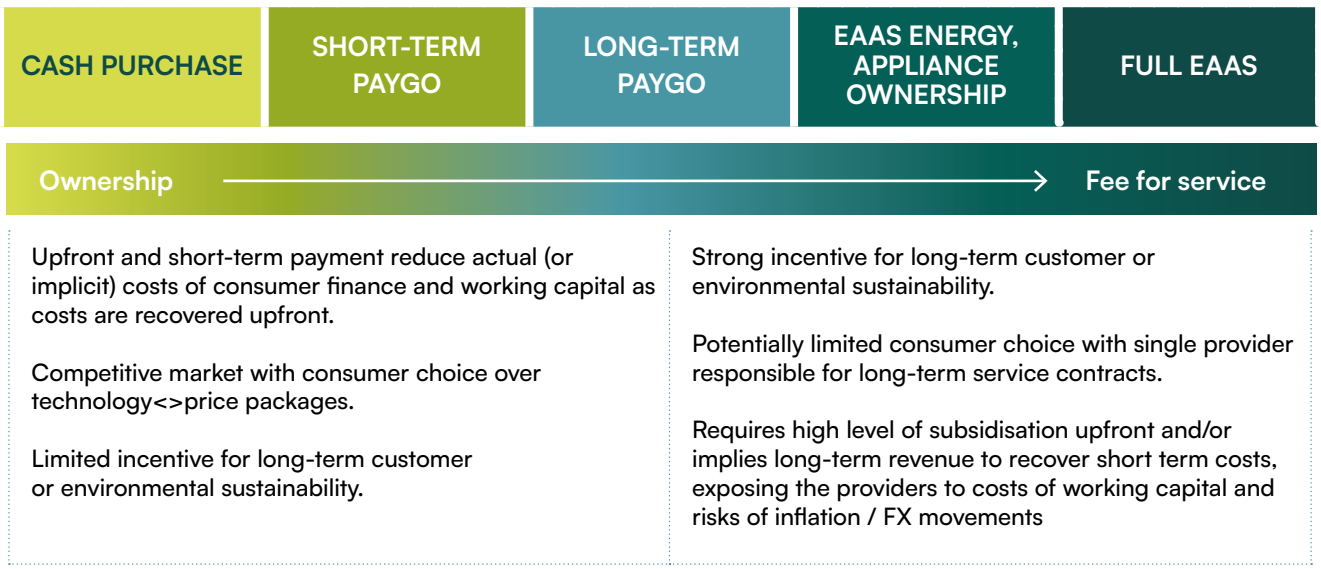
4.2. Long-term customer outcomes and sustainability

In principle, the EaaS business model incentivises innovation to provide better long-term customer outcomes. EaaS incentivises innovation towards products that are designed to last as long as possible, and which can be maintained, repaired, and replaced cost effectively. Since the service provider relies on an ongoing stream of revenues from customers to remain financially sustainable, it is incentivised to ensure systems continue to perform well and meet customer needs. This is already influencing hardware design, with the REAL consortium working on batteries with longer lifespan to increase product sustainability and decrease costs of replacements.

> "The fundamental problem is trying to electrify people who can't afford it."
>
> **[FINANCIER]**

> "You can't connect everyone in the village in a commercially viable way. Need to only install for people who are willing and able to pay. [...] In some villages might be only 10% or 50% of people, but not by engineering your prices so can capture more (by under-pricing)."
>
> **[OFF-GRID SOLAR PROVIDER]**

Figure 6: Ownership versus fee for service business models



This can also embed the right incentives for end of life (e-waste), which is a major challenge for the standalone solar sector. Since 2010 over 150 million solar energy kits have been distributed throughout Africa, of which it is estimated that estimates that nearly 75% have ceased functioning.[42] The EaaS business model could require the service provider to commit not only to repairs but also to sustainable electronic waste management and disposal, incentivising full life-cycle responsibility. In some contexts, this may be challenging to do, or to do cost-effectively, as there may be limited (or no) existing ecosystem of third-party service providers able to recycle and sustainably dispose of e-waste.

Entry-level solar homes systems and lighting products typically have a relatively short asset life, although there is mixed evidence on this. SolarAid research in Zambia found that for 90% of households surveyed, their pico solar system lasted 1-3 years, with battery defects at fault most (73%) of the time.[43] However, other off-grid solar providers interviewed suggested this is improving, especially for Tier 1 SHS and above, where products can last more than five years.

This presents a potentially significant advantage over other standalone solar business models, which have tended to incentivise customer acquisition over customer portfolio quality.

The challenge of sustainable e-waste management is that it comes at a cost that must either be subsidised or passed on to customer bills. The cost of e-waste is typically not internalised by anyone — including energy access providers, who are focussed on addressing affordability by keeping prices as low as possible. Indeed, "e-waste management is often seen as a burden and an investor relations issue rather than an opportunity for bettering company operations overall".[44] Either the cost of e-waste management will need to be subsidised, or it will be reflected by an increase in customer bills. Nonetheless, there are ways to embed more sustainable approaches into other business models, with some providers noting they have a strong incentive to maintain service to their customers through repairs, upgrades, and extended warranties.

> "One of the things EaaS can do well is developing their own products where items can be repaired and replaced. It can increase sustainability when systems are designed for a slightly longer period than the PAYGo payback period."
>
> **[DEVELOPMENT PARTNER]**

> "The quality of the equipment, the repairability; those are going to improve compared to traditional PAYGO model."
>
> **[FINANCIER]**

> "There are plenty of off the shelf systems and most of the components are standard. The companies were pushing product downstream and had no reason to service the customers right or sustainably."
>
> **[OFF-GRID SOLAR PROVIDER]**

42. SolarAid. (2023). Off Grid Solar Repair in Africa: From Burden to Opportunity. https://solar-aid.org/news/off-grid-solar-repair-in-africa-from-burden-to-opportunity/.
43. Ibid.
44. Triple Jump. (2025). Advancing E-Waste Management & Circularity at Off-Grid Solar Companies in Africa: Lessons Learned from a Technical Assistance Programme. https://triplejump.eu/wp-content/uploads/2025/08/250718_TA-case-study-solar-e-waste_TJ-Cygnum-dss.pdf.

It is too early to tell if this can be done cost-effectively, and other business models can adapt to (partially) achieve these outcomes. A challenge to date has been that companies *"struggle to find trustworthy, licensed e-waste management providers, especially in challenging markets".* While EaaS is set up to incentivise better e-waste management, it may have to overcome practical (and cost-related) challenges to sustainably manage e-waste. Furthermore, the cost (and cost-effectiveness) of repairs and e-waste disposal remain highly uncertain, with challenges including: *"spare parts [that] are often hard to source, expensive due to import taxes, or of inconsistent quality*" and a *"lack [of] technical capacity to carry out repairs safely and efficiently"*.[45]

One of the questions the EaaS approach will need to work out is how to enable progression to higher tiers of energy access. EaaS pilots have tended to offer a single product to electrify entire communities **(see Box 3 on SolarAid's pilot in Malawi for example).** Over time, some households in these communities may want (and be able to pay for) higher-tier energy access. Options to make sure customers can upgrade would need to be built into EaaS if used at scale, allowing those that can afford to, to move up the energy ladder, or by making sure households have access to choice of other technologies and business models.

4.3. EaaS' role alongside other energy access business models

If EaaS is used to serve the hardest-to-reach and most remote communities, there would be limited risk of competition between EaaS and PAYGo or other business models. EaaS could be used where PAYGO and mini-grids are largely unavailable because they cannot be deployed in a commercially viable way. This can be strengthened further when the focus of EaaS is aligned with government priorities around grid extension and is deployed in areas where the grid will not come in the coming five — 10 years.

There are important questions around the extent of subsidisation needed for the EaaS model to work at scale. There is a general acceptance of the need for subsidies for last-mile energy access. However, many stakeholders interviewed felt that, with the right amount and structure of subsidy, mini-grids or PAYGo could reach even the poorest and hardest-to-reach.

> "The circularity of EaaS makes sense — it is not about throwing out products that would otherwise be dumped, it is more about increased sustainability in the supply chain which makes a lot of sense."
>
> **[FINANCIER]**

> "Ideally, PAYGo companies would repair and upgrade previous systems rather than selling new systems, but not sure they are incentivised to do this."
>
> **[FINANCIER]**

> "EaaS has a risk of locking poorer households into basic access that does not enable them to grow out of financial poverty that higher tier solutions might be able to do."
>
> **[FINANCIER]**

> "I don't think EaaS is, or should be, the end goal. But it has great potential as a First-Time household energy access, and based on that can create a lot of valuable data on consumption patterns, so second time electrification can better know what that community can afford."
>
> **[FINANCIER]**

45. Ibid.

There is no consensus among stakeholders as to whether an open competitive market, or some form of concession is better for EaaS. Energy as a service companies could be left to compete openly alongside other business models, or could be granted a single-provider status, in a concession-type approach. Competition would help maintain incentives for efficiency and for consumer choice, with competitive pressure pushing down price and improving quality of services offer through a wider choice of products. On the other hand, to the extent EaaS relies on operational scale and high penetration in the communities it serves, exposing it to competition may undo the economies of scale that serving an entire community could unlock.

EaaS could be supported through adapting results-based finance programmes to offer a level-playing field between different business models. The advantage would be allowing competition among different business models both for funding, and to acquire customers. The two challenges may be that: (1) the RBF structure would need to suit both the long-term approach of EaaS, and the shorter time horizons of e.g. PAYGo companies, and (2) in the case of EaaS, it may desirable to limit overlap of providers in the same region, as EaaS relies on a dense customer base and high penetration rates in the community it serves. For example, the recently launched +Energia RBF for EaaS in Mozambique requires EaaS companies to serve areas where there is no current grid connection, limited penetration of existing SHS providers, and a target to achieve at least 50% penetration.[46] It also restricts pricing to no more than USD3 per month to ensure affordability. It follows a similar structure to how RBF for PAYGo might be structured, with 25% of the funding provided to (partially) cover acquisition costs, 15% on installation of the system, and the remaining 60% in equal blocks after 12 and 24 months if the product were still in use.

It is worth noting that competition is unlikely to occur among commercial businesses in the hard-to-reach market segments. To the extent that EaaS is seeking to provide a solution for communities with near-zero energy access at present, a highly competitive marketplace seeking to serve these communities is unlikely to emerge. While subsidies could be offered to multiple providers to compete in the same regions, it is not clear if the benefits of such (highly subsidised) competition are greater for customers than a single service provider — with strong oversight and regulation to maintain a high quality of service at affordable prices.

> "Concessions should not be used; they become a monopoly which for DRE does not make sense, not even for mini-grids [...] locking customers for 20 years with an operator that has no incentives to innovate."
>
> **[FINANCIER]**

> "I am a strong believer in competition — even in the case of mini-grids I would still argue for competition. Even in that case, we should be happy to see C&I companies come in, or SHS, and take potential customers from the mini-grids."
>
> **[FINANCIER]**

> "I am not sure that competition approach is helpful; can become a race to the bottom, pushing prices down to unsustainable levels, and customers signing up for multiple SHS."
>
> **[OFF-GRID SOLAR PROVIDER]**

46. +Energia. (2025). Results-Based Financing (RBF) Funding Window 2: Energy-as-a-Service. https://maisenergia.co.mz/wp-content/uploads/2025/06/RBF-EaaS-DRE_Call-for-Proposal-1_v01.pdf.

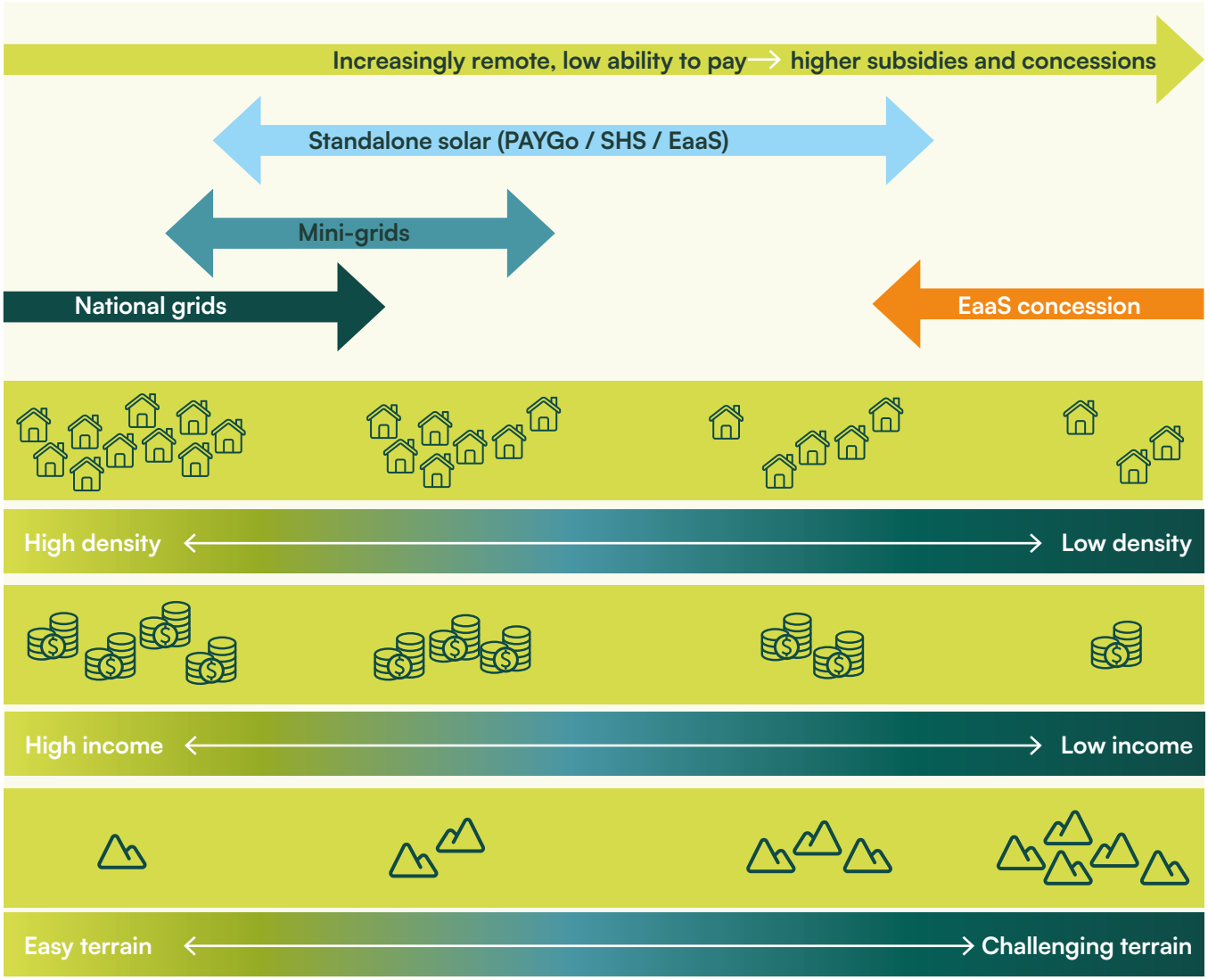
A single provider approach could generate cost-efficiencies and allocate clear responsibility for outcomes to a sole provider. The latter may have appeal if the cost efficiencies associated with serving an entire community (i.e. achieving scale in terms not only in terms of units, but units within a same community) are substantial **(see Section 3.2)** and EaaS companies need to be shielded from competition in order to unlock cost-efficiencies.

One option could be to allocate single-service providers for communities that are not suited to commercial forms of energy access in the near-term. In the same way that urban areas with relatively high ability to pay, high population density, and flat terrain, are well suited to grid-electrification, at the other end of the spectrum low income, dispersed, and hard-to-reach communities may be best served by a single service provider **(Figure 7)**. This may not imply a formal and legally separated concession — which would be costly to set up and relies on stable governance. It could be done implicitly through concessional funding, with defined minimum service levels.

Concession comes with a significant risk, as in the case of poor performance, it is not clear how easy it would be to replace the single provider. If there is a separate AssetCo, the legal ownership of the solar energy kits could be maintained independent of the operator. A service level agreement could be defined for the operating company responsible for maintaining service provision and payment collection. What is less clear is the consequence of underperformance. In a typical physical infrastructure setting, the licensee could be removed and the concession retendered. However, in the EaaS context, the way the pilot is rolled out and implemented on an ongoing basis is heavily linked to the operator, and it would not be trivial to appoint a different service provider to take responsibility for servicing assets installed and managed by a previous operator. Like the issue for PAYGo SHS, there would be challenges to overcome around system interoperability such that a new OpCo could be found that is able to take over operations of the same assets at low cost, and improve on the previous OpCo's performance levels.

> "The strength of EaaS is to tackle a whole village; so co-existence within a country, where different communities could benefit from the different models."
>
> **[DEVELOPMENT PARTNER]**

Figure 7: EaaS and other energy access models by community context



Yohane Makhuwalo and Thandiwe Elemphant, Kasakula, Malawi.

Source: SolarAid/Kondwani Jere

5. STRUCTURE AND COSTING THE ENERGY AS A SERVICE BUSINESS MODEL

5.1. Cost and revenue generation in the EaaS approach

The core cost structure of the EaaS business model is similar to other energy access businesses, and can be characterised as:

Upfront capital:

cost of acquiring the hardware, international transportation, and clearing customs.

Customer acquisition and installation:

related to community engagement, customer awareness, in-country logistics, and installation of systems.

Ongoing service and payment collection:

for regular customer service and collecting payments — be that in cash through agents, at retail points in the communities, or through digital (mobile) payment systems.

Repairs, replacements, end of life:

as systems age, the EaaS business model will incur costs of refreshing the asset base and sustainably disposing of any e-waste arising.

These costs relate to physical service delivery, and do not include (implicit) financing costs. These are discussed in **Section 7** as they depend on how the EaaS model is financed, and whether there will be any working capital and external debt required.

With the EaaS approach calibrated to affordability, it is likely to be bringing in around USD2-4 per customer per month. The approach to lowering monthly fees can of course also be achieved in other business models such as PAYGo, either by increasing subsidies, or by offering longer term payment plans. These can result in lower default rates and better customer retention,[47] although other companies have found higher default rates associated with longer repayment plans. The effectiveness of EaaS compared to PAYGo may also depend on expectations and attitudes of different customer segments, as some segments may expect to own assets that are situated on their property (unlike the national utility analogy).

The question is how much of the operational costs this revenue can cover. Servicing what are relatively low-cost entry-level systems may be relatively expensive to do — the cost of payment collection and customer service associated with small systems is similar in absolute terms (and larger in relative terms) compared to larger systems. This is also why the PAYGo business model has tended to be used for solar home systems and is less common for multi-light systems and lanterns, where the opex associated with ongoing service is too high given the price of the systems.

A first mid-term evaluation of SolarAid's Light a Village EaaS pilot Malawi reveals usage levels which may cover a high share of opex but would not be sufficient to cover capital costs. As set out in **Box 3**, the pilot generated around USD11 per customer per year — although this has recently increased to USD16 per customer year following an increase in the daily fee and the introduction of self-service mobile payments. While this appears to be enough to cover the operating costs recorded by SolarAid in the first few years, it is not clear it will be enough to cover the cost of increasing maintenance costs over time, and is unlikely to cover capital investment, or generate sufficient margins to attract investment capital.

> "With smaller systems in bulk, operations and maintenance (O&M) can be challenging on low-cost systems."
>
> **[SECTOR EXPERT]**

..47. Yariv Cohen. (2025). Four Key Lessons for Implementing PAYGo 2.0: How the PAYGo Solar Sector Can Fulfill its Potential. https://nextbillion.net/four-key-lessons-implementing-paygo-how-paygo-solar-sector-can-fulfill-potential/.

BOX 3: SOLARAID'S LIGHT A VILLAGE PILOT IN MALAWI[48]

Overview of Light a Village

SolarAid's Light a Village pilot reached all 8,813 households in Kasakula in August 2025. This milestone was reached after a phased rollout since 2021, in which four phases:

Phase 1 connected 500 households in 2021, and a further 76 schools and homes of teachers in 2022 as a proof of concept.

Phase 2 connected a further 2,000 in 2023, testing consumer willingness to pay/ payment fatigue,

Phase 3 with support from the REAL Programme Catalyst connected 1,500 households in 2024, stress testing the operational model to position for scaling.

Phase 4 connected the remaining 4,750 households in 2025 to reach 100% electrification and prepare for scaling.

Kasakula is a relatively remote, poor community, in Malawi's Ntchisi district; 97% of the population lives below the national poverty line, and while the national grid does reach the district, no households in Kasakula are connected to the main grid and very few had access to standalone solar systems. It has very low population density at just 185 people per square kilometre, compared to just under 1,000,000 per square kilometre in the capital city Lilongwe. While it is just 90 kilometres from Lilongwe, it takes four - six hours to reach by car.

Light a Village installed entry-level multi-light systems for all households. Households had a choice to sign up and could also opt for a lease-to-own model. Customers do not have choice of system design — all are using Tier 1 three-light, 11-12-watt peak systems. In the initial pilot phase, Sun King Home 200X and Omnivoltaic systems were used; subsequently switching to Moon Energy systems and working with Moon to develop a Tier 1 product tailored to the needs of EaaS (more durable and repairable).

Each household pre-pays 100 Malawian Kwacha per day to activate their system. This increased in 2025, from 70 MWK previously. During this time, all payments were manually collected. Agents either went past houses, or customers could go to a hub.

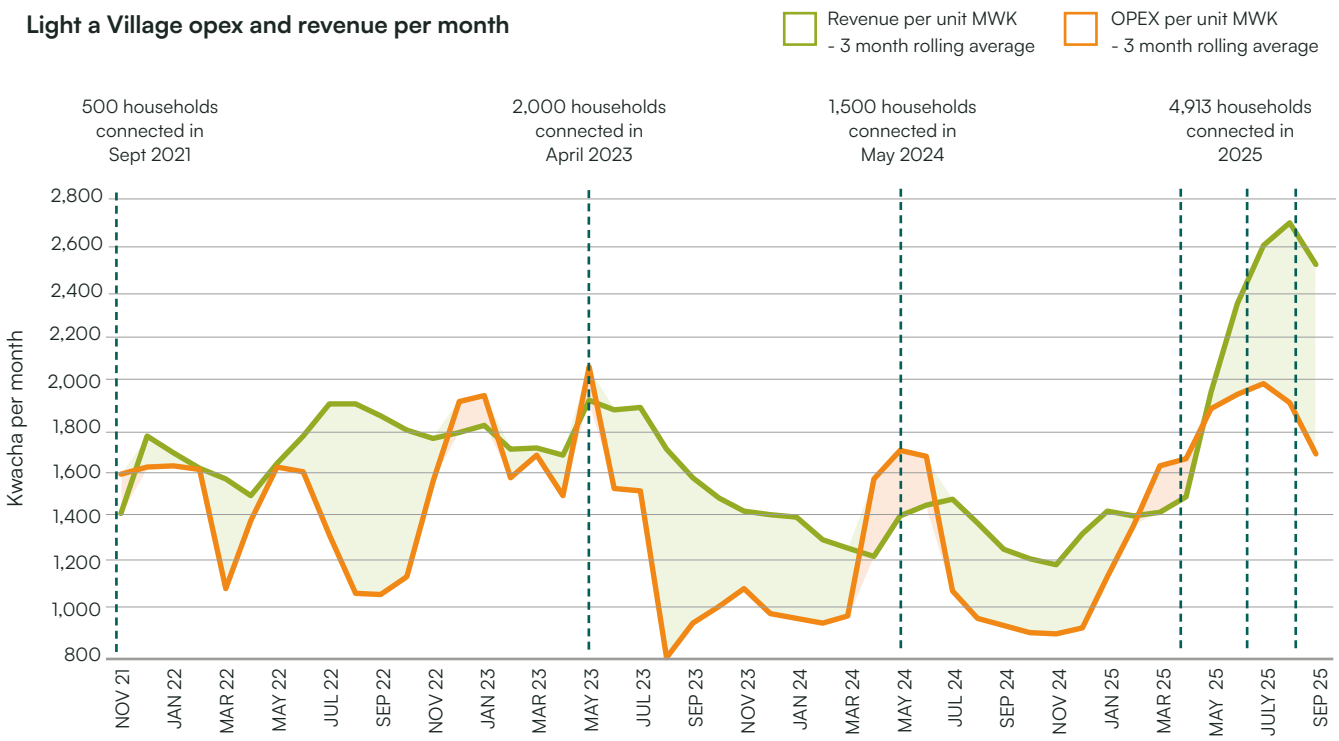
Installation of the solar home system in customer Kennedy Buleya's house, Kasakula.
Source: SolarAid/Konwdani Jer

48. Efficiency for Access. (2026). Lighting a Path to Affordability: Mid-Term Review of SolarAid's Light a Village Energy as a Service Pilot in Malawi.

Findings from the Light a Village pilot

Light a Village has rolled out through several phases, reaching 4,076 connections by the end of 2024 before reaching all 8,813 households over the course of 2025. The LAV evaluation focused on the 4,076 deployed up to end 2024, for which there is a long enough customer usage history to analyse trends (for some households going back several years).

Light a Village opex and revenue per month



Customer usage rates declined from above 80% in 2021 and early 2022 to under 70% by the end of 2024. While many households (around 25%) use their system very frequently — more than 90% of the time — there is a long tail of lower usage, with for example one-in-five households using their system less than half of the time. There may be many reasons for this, including delays to customer service (repairs and payment collection / system activation) during periods where opex was relatively lower. Indeed, looking at the graph above, opex and revenue collection appear to move in tandem. It is also notable that since a self-service digital payments have been available from mid-2025, there has been a significant uptick in usage rates and revenue generation.

Two-thirds of customers at some point went a month without using their system. Similarly, 45% have gone a month without using their system at least twice, while one in three customers have gone 60 days or more without paying to use their system, and 15% of customers have not made a payment to use their system for 90 days on at least one occasion.

On average, revenue generated per system has fluctuated around MWK 19,000 (USD11) per year, while operating costs have averaged MWK 17,000 (USD9-USD10). Opex has been highly variable over time, reflecting the nature of the pilot and experimentation with different approaches to staffing levels, and customer service. Overheads are included in opex, but repair costs and e-waste management are not yet included in these estimates, and would be expected to represent an increasingly important share of costs as systems age. These operating costs do not include the initial cost of acquisition and importation of the hardware (around USD50-USD65)[49], nor installation costs (which vary significantly over time, and came down to USD4 per system for the latest batch of installations in 2025). This results in an operating margin of around USD2 per system per year — which would be USD20 over 10 years. It is uncertain if this is enough to cover the increased opex associated with repairs and e-waste management that will be increasing over time, and does not appear to be enough to generate any contribution to the costs of the hardware and installation.

49. Various systems have been trialled in the pilot, with more expensive (USD65) systems favoured in the more recent batches of deployment, for systems that should be more cost-effective to repair with commitments from suppliers to make available spare parts over at least 10 years.

5.2. Separating the AssetCo and the OpCo

In this section we explore how the EaaS could be structured and financed. EaaS for first-time electrification will need some form of subsidy, and how it is structured and financed will be essential to making good use of limited public funding.

One option would be to separate (and finance/fund separately) the assets and the operations. That is, have an "AssetCo" that funds the acquisition of, and owns all the assets, and an "OpCo" which services the asset base and provides retail and after sales services to customers. By separating the initial capital costs, which include acquiring systems and clearing imports to the destination country, ongoing operations could require relatively little financing. In this approach, the OpCo collects revenue from users to cover (some or all) of their costs, and could potentially pay a fee up to the AssetCo to recoup the initial capital outlay. Alternatively, customer revenue could go into an account managed by the AssetCo, which then pays the OpCo according to terms set out in a performance-based contract.

The operating company should, in principle, need minimal ongoing subsidy, and minimal external finance. Minimising external financing requirements in the form of debt and equity helps keep the business model affordable, as it minimises the need to generate returns for investors. The operating company should be able to finance operations from its balance sheet, with revenues each year covering costs. However, as noted elsewhere this remains to be demonstrated, especially in very low ability-to-pay and hard-to-reach customer segments, and in the later years when systems will increasingly incur costs associated with repairs, replacements, and e-waste management.

Where upfront costs are recovered through customer payments over time, ensuring high utilisation rates among customers is important. If EaaS has the full initial costs of hardware subsidised, this may help it avoid some of the pitfalls of the PAYGo model, which has seen companies get caught in a debt spiral — taking on more-and-more debt to fund operations and growth, and never being able to service that debt sustainably. However, with "PAYGo 2.0" there is an increasing push to improve customer payment rates to improve commercial health of companies.[50] This is akin to the EaaS business model, which while customers are not paying to own their system, in the same way as PAYGo relies on customer payments over time to cover the costs associated with the business model.

Using high upfront subsidies instead of external finance helps EaaS companies keep costs to customers down. Especially in comparison to PAYGO companies that have grown into partial consumer financing companies including increased credit risk functions. Additionally, it could lead into a scale-up model without growing needs for working capital finance, which has been a challenge in general for scaling up PAYGO companies, especially without substantial amounts of equity available in the market. However, this relies on sufficient funding to fully fund the initial cost of installing systems, otherwise EaaS providers would need to raise external finance, and recover the cost of system installation and the associated financing costs, in much the same way as PAYGo companies do.

> "We don't need a lot of external finance for the OpCo part if the capex is bought down and no consumer finance is needed in the model."
>
> **[OFF-GRID SOLAR PROVIDER]**

50. PAYGo Lab. (2025). PAYGo 2.0 Pioneers: Early insights and evidence. https://www.maf-lab.com/_files/ugd/552189_6822cce941684a51b1849dccac669f3c.pdf.

> "The beauty of the model is shifting risk away from the operators which can be cashflow positive from the beginning, and keep the complexity and subsidy at the AssetCo level."
>
> **[OFF-GRID SOLAR PROVIDER]**

This raises two challenges, which may mean operating companies may need to be carefully regulated, and/or social enterprises rather than profit-seeking businesses:

- **A possibly weakened incentive for high-quality operational performance.** While EaaS operators need to maintain long-term service provision to generate revenues, it appears likely that they can at best generate only a slim profit margin (if any). There is therefore little financial incentive for companies (or their investors) to undertake these activities, with very limited return on offer. This in turn means the operating company may have limited incentive to be cost-efficient, as cost overruns may be covered by subsidies, and successful cost minimisation is unlikely to generate a significant payback.

- **Limited ability to recover or provide a return on the asset / infrastructure side.** With the operating company expected to at best break-even (with possibly a thin margin), it is highly unlikely that the revenues generated will be sufficient to recover the initial costs — never mind provide a rate of return — on the capital assets.

Incentives could be enshrined in regulation, with service level agreements in place for the OpCo. Strong governance with clear, binding and high-quality service level agreements between AssetCo and OpCo are needed. The AssetCo will need to do an in-depth due diligence on potential OpCos, if there is to be any stream of revenue provided from the OpCo up to the AssetCo. Similarly, the OpCo will need to be able to influence the choices of the AssetCo, which remains the owner of the assets and needs to bear responsible for the suitability and reliability of the systems which the OpCo installs and services.

The 100% capital subsidy approach is not unique to EaaS and could be applied to other business models such as PAYGo and cash sales. This would allow for a like-for-like comparison; PAYGo customers would have much lower monthly repayments to "own" their system, which would have to cover the PAYGo company's operating costs and provide a rate of return, after which customers would own an unlocked system. Alternatively, customers could "buy" a product cash over-the-counter with a 100% discount (i.e. zero price), with an option to pay for a five- or ten-year warranty service that would commit to replacing or repairing systems as needed. Where EaaS really differentiates is in ensuring the energy service provider retains responsibility for the asset (and e-waste), as discussed in **Section 4.2.**

> "Relying on small local OpCos who haven't done this in the past is a risk; vertical disintegration has not been proven to work better."
>
> **[FINANCIER]**

> "We need long-term continuous trust in reliable OpCo partners that they will indeed do the long-term service element."
>
> **[OFF-GRID SOLAR PROVIDER]**

> "If you split it into OpCo and AssetCo, you need to make sure the OpCo doesn't leave as soon as it gets tough. Need to work out e.g. how to make sure the OpCo provisions enough to ensure maintenance, spare parts etc."
>
> [FINANCIER]

5.3. Implicit financing costs in the EaaS approach

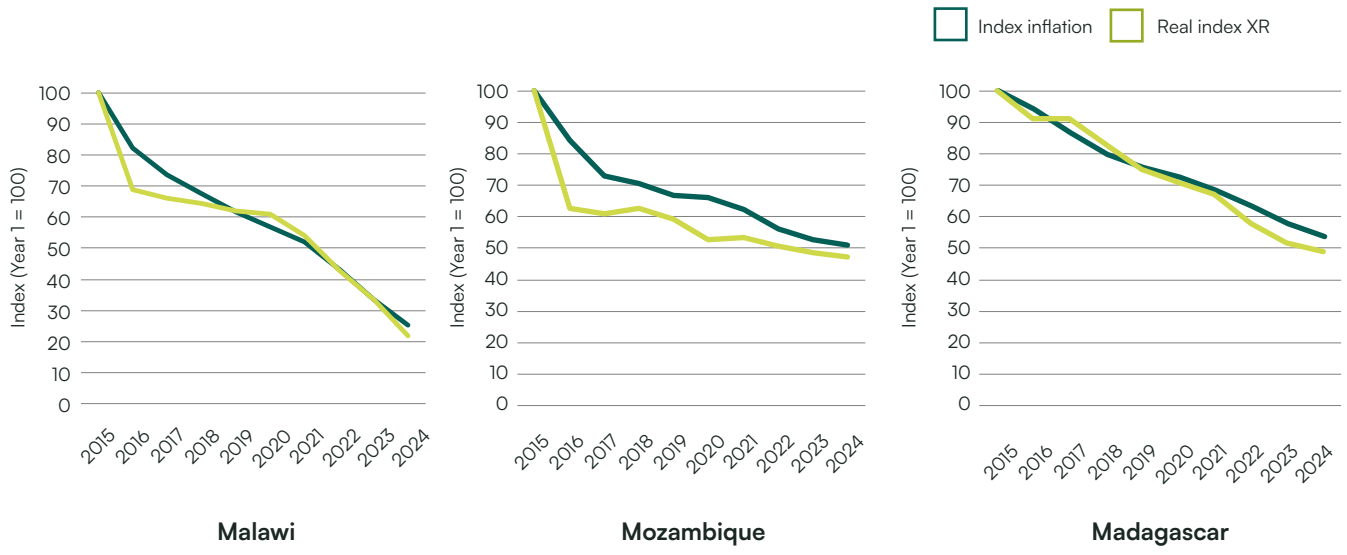
If EaaS were to repay the initial cost of capital deployment it will face challenges related to inflation and currency depreciation. If the initial capital costs for acquiring and importing systems are not fully subsidised, any upfront finance that is repayable and expected to deliver returns must overcome risks such as inflation when finance is in local currency, and exchange rate depreciation when finance is in hard currency but revenues are collected locally.

These challenges are similar for the PAYGo model, and if anything may be accentuated under EaaS, since the financing period would be longer. The longer the period over which costs are recovered, the higher the risks associated with inflation and depreciation which erode value for financiers. **Figure 8** illustrates these risks for three illustrative countries: Malawi, Mozambique and Madagascar. In all three cases, over the last ten years, the value of 100 units of local currency finance, or 100 units of hard (USD) finance have eroded by 50%. This means investors would be looking to recover at least double their initial investment in nominal terms, plus a rate of return.

Taking Malawi as an example, had an EaaS provider deployed systems ten years ago in 2015, the value of any finance in Malawian Kwacha would have eroded by 75% by 2025. That is, 100 Kwacha loaned to (or invested in) an EaaS entity back in 2015 to deploy capex, would be worth just 25 Kwacha in real terms (the green line) by 2025. Similarly, accounting for nominal exchange rate moments and US inflation, USD100 in hard currency loaned back in 2015 would be worth just USD22 by 2025 (the yellow line).

In conclusion, for EaaS to remain cost-effective, it will likely need a high upfront subsidy, and/or subsidised access to long-term finance. If the full cost of deploying systems is funded by upfront non-reimbursable grants, the financing costs can be minimised. If some initial costs are recovered over a five — 10 year period, financiers may need to accept returns well below market rates, for example at zero percent interest. This would mean accepting a real loss and only recovering the nominal loan value. It would also require either subsidised local currency hedging or lenders willing to bear potentially significant losses from currency depreciation, which could reduce recovery to around 25% of the original US dollar loan.

Figure 8: Inflation and FX depreciation effects in Malawi, Mozambique, and Madagascar[51]



51. The real index of the currency exchange rate is calculated using the US-local currency exchange rate for the ten years, and adjusted for the US inflation rate.

Grandmother Buleya stands under the glow of a solar light outside her home in Kasakula, Malawi watching as her grandchildren play safely after dark.

Source: SolarAid/Kondwani Jere

6. FIT-FOR-PURPOSE PERFORMANCE METRICS FOR EAAS

The EaaS model differs from both PAYGo, and from utility-scale electricity, and would need to draw on KPIs from both models. There is broad consensus that there is no need to reinvent the wheel and create a complex and new set of indicators, but that a small number of clear and effective indicators could be agreed.

The core function of KPIs adapted to the EaaS model would be to both:

(1)
ensure the service providers maintain sufficient commercial performance (profit) to cover their costs including when faced with external shocks, and

(2)
to monitor usage and service levels provided to customers, including the potential to step up to higher levels of energy access over time.

Figure 9: Structure of KPIs for EaaS

The core impact and financial viability indicators would track penetration and usage rates. This would mean tracking simple indicators such as:

- Percentage of households in target community connected and active users: this should be tracked over time to see how many households remain active users over say a five — 10 year period.
- Average usage rates of households.
- Progression of households to higher tiers of service (if these can be offered).

The cost side is more complex, and this is where a number of metrics could be proposed Given the focus on entry-level Tier 1 systems, it is likely that a single metric such as the levelised cost of electricity will not be a good metric. Instead, a levelised cost of access could be calculated[52] , although this in turn falls short in that it does not capture any variation in the level of service provided.

> "What we are not really measuring is progression over time; it would be critical to show this technology can help people to progress to higher tiers."
>
> **[FINANCIER]**

52. Alex Tourre. (2025). Blog - A is for Access: Rethinking the Cost of Off-Grid Energy Solutions. Accessed on 10th April 2025. https://www.linkedin.com/pulse/access-rethinking-cost-off-grid-energy-solutions-alexandre-tourre-euomf/?trackingId=oEOxDCAq3H2QKuVd5hk2tw%3D%3D.

> "The amount of electricity provided is important — not just access — so while LCOE is not a perfect metric, at least you are comparing like for like."
>
> **[FINANCIER]**

While the EaaS model is new and is developing a proof of concept, it would be very helpful to split costs into a clearly identifiable cost centre. In particular:

- **Acquisition of hardware** — i.e. landed cost at port of entry / main distribution centre. This may be quite different for the EaaS model, to the extent that systems may be designed for longer-term sustainably, making them initially more costly, but reducing longer-term maintenance costs (**final bullet below**).
- **Customer acquisition** — i.e. costs of community engagement, sales, local distribution, installation and activation of customers.
- **Customer service and payment collection** — operating costs associated with ongoing customer service, processing payments, and managing systems.
- **Repairs, replacements, and redeployment** — this is the key differentiator of the EaaS business model to others (e.g. PAYGo), so cost per incident should be tracked robustly to understand the implications for opex as systems age and need increasing maintenance and replacement of component parts.

Finally, as the EaaS service provider may end up in a position of near-monopoly, service quality levels will also need to be tracked carefully. As a single provider with potentially limited choice, customer protection and ensuring high service standards will be even more important than in the PAYGo business model. Indicators could include:

- Consumer satisfaction rates.
- E-waste decrease / repairability increased / product lifespan increased.
- Share of systems defaulting at any point in a rolling 12-month period.
- Time to resolve faults.

> "Sales and connections are too easy to achieve — it can sell like crazy. We need to be measuring how often these are being used or paid for."
>
> **[OFF-GRID SOLAR PROVIDER]**

> "Transparency on the actual OPEX costs is needed."
>
> **[FINANCIER]**

From these indicators, it should be transparent the extent to which operations are financially sustainable. By collecting robust unit cost and unit revenue data, it should be easy to calculate the operating profit of companies (covering customer acquisition and ongoing costs), and the potential to:

(1)
Make contributions to the original upstream capital costs, and

(2)
Put aside a working reserve to fund replacements and repairs over time.

> "Data creation can be a big advantage, and if systems are scalable can help move up the energy ladder. But this is only true if the data is shared / accessible to others, or if the EaaS provider can do upgrades etc."
>
> **[FINANCIER]**

Wala's decentralised solar systems, Malawi.

Source: Efficiency for Access

7. FINANCING ENERGY AS A SERVICE: PUBLIC FUNDING OPTIONS

7.1. Funding mechanisms

Each of the business models (cash sales, PAYGo, EaaS) can be paired with various forms of financing mechanisms, targeted to reach low-income customers.

The types of financing mechanisms could include:

(1) Full upfront capex subsidy	(2) Results-based finance — supply side subsidy	(3) Results-based finance — demand side subsidy	(4) Concessional financing to companies	(5) Concessional financing to customers

In principle, each of these financing mechanisms can be applied to each of the business models — there is no inherent advantage of PAYGo over EaaS (or vice versa) in terms of how subsidies could be administered.

In the end, all the financing mechanisms seek to reduce the price for end users and make access to services more affordable, while ensuring businesses are commercially viable. This includes supply side subsidies, which by paying down some of the costs for suppliers, should translate into sustainable price reductions. The link to price reductions is often more direct for demand side subsidies, which require companies to show that the subsidy is used directly to reduce prices in proportion to the amount of subsidy received. For example, in Malawi EnDev runs a DSS programme with the aim to provide energy access up to 200,000 people (including clean cooking, of which the target for standalone solar is 70,000),[53] with the subsidy delivered directly to consumers through companies via RBF,[54] to put towards lowering the price of cash or PAYGo sales.[55]

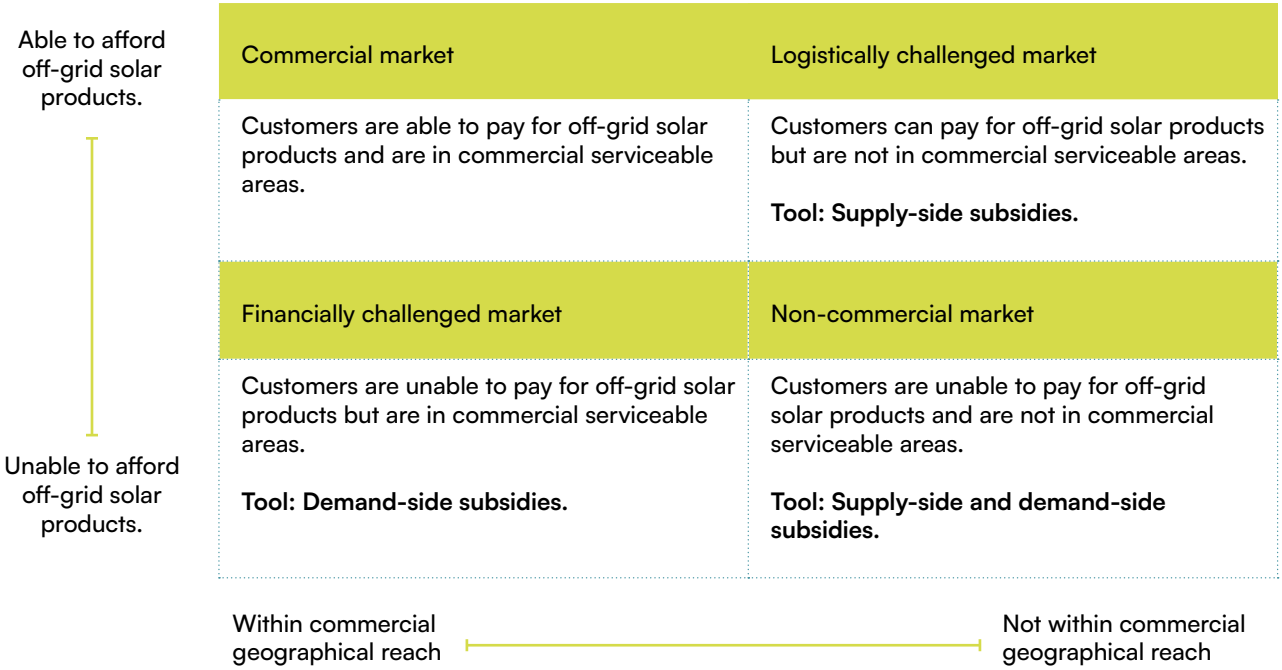
A combination of business models and financing mechanisms will be needed to reach the last-mile consumers. Offerings which combine elements such as EaaS with flexible repayments and end-user subsidies may have the potential to reach the most consumers.[55]

7.2. Targeting public funding for first-time electrification through EaaS

To reach the poorest and hardest-to-reach communities, a subsidised approach is needed. As laid out, the EaaS model requires a high level of subsidies, at least at the CAPEX level and potentially also to cover part of the OPEX since none of the commercial business models have been able to deliver to these communities. The exact subsidy structure or amounts needed depend on several factors. As set out in **Figure 10**, communities that are lacking energy access may not be (at least initially) commercially viable for one of two reasons. Either they are too costly to serve, as it is logistically complex to reach them, and/or they have too limited ability to pay the full commercial price for energy access products.[57] In these market contexts, business models that embed some form of subsidy will be needed.

53. EnDev. (2023). Malawi: Enabling Energy Access through Demand-Side Subsidies (DSS). https://endev.info/wp-content/uploads/2023/11/231023_EnDev-DSS-Factsheet_Malawi.pdf.
54. EnDev. (2025). Demand-Side Subsidies (DSS) Component. https://endev.info/countries/enabling-energy-access-through-demand-side-subsidies-dss/.
55. EnDev. (2024). Demand- Side Subsidies Results-Based Financing Programme: Call for Applications. https://cleancooking.org/wp-content/uploads/2024/06/1_DSS-RBF_Call-for-applications_20240527_FINAL.pdf.
56. Practical Action. (2023). Can Market Mechanisms Facilitate Energy Access for People Living in Extreme Poverty? Part 2 — The Role of Market Interventions and Business Models. https://infohub.practicalaction.org/server/api/core/bitstreams/ca5aa5f1-8476-417e-ba68-137912269b8d/content.
57. EnDev. (2024). RBF Projects that Leave No One Behind. https://endev.info/wp-content/uploads/2024/10/241022_RBF_LNOB.pdf

Figure 10: Determining the need for, and type of subsidies, to support energy access [58]



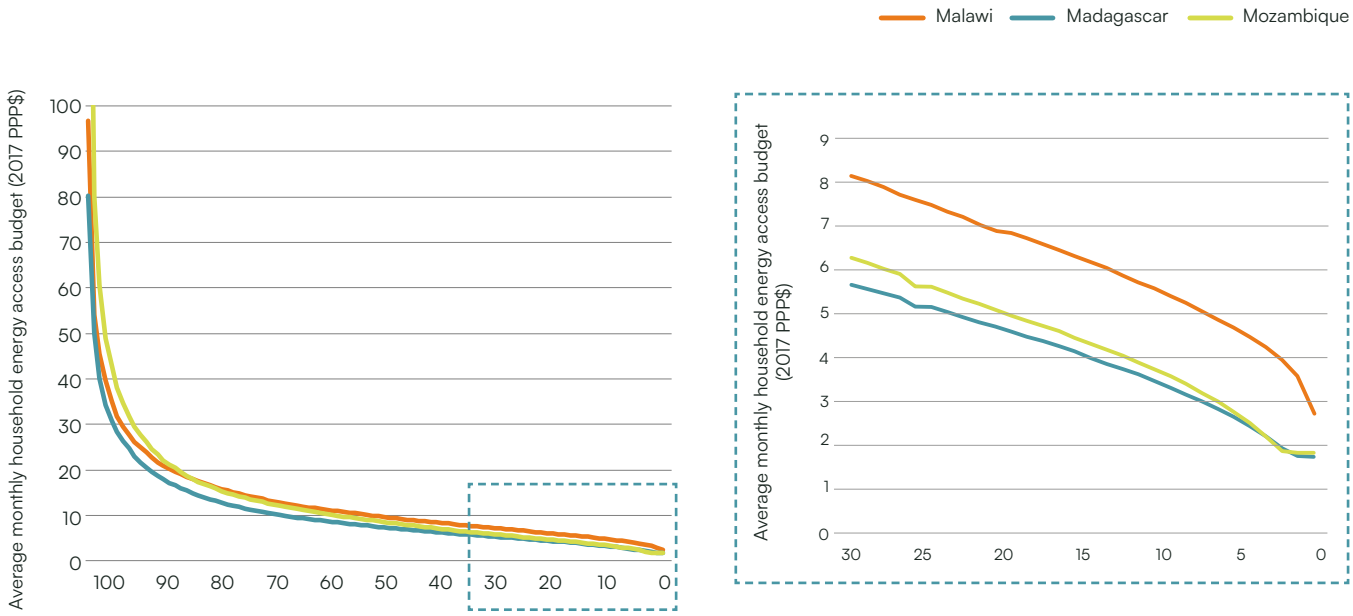
Where EaaS seeks to serve these poorest and hardest-to-reach communities, there is relatively limited risk of inefficiency in terms of over-subsidisation. The ability to pay of the poorest households is likely to be relatively homogeneous, with relatively low variation in income levels in the poorest and hardest-to-reach communities. As an illustrative example, **Figure 11** shows the consumption expenditure distributions for Malawi, Madagascar and Mozambique — three countries where EaaS is being piloted. As shown, for much of the population, the ability to pay for energy access, proxied by 5% of all consumption expenditure, is relatively flat. Indeed, the right panel shows that the poorest 30% of the population can afford no more than USD8 per month. These low ability-to-pay households are likely to comprise a very high share of households in the most remote, hardest-to-reach communities — there is unlikely to be a significant proportion of very high earners living in these communities. This is confirmed in practice; SolarAid's Light a Village pilot found that 97% of customers live in extreme poverty in the community they served **(see Box 3).**[59]

As noted in Section 4.3, these are customer segments that profit-seeking companies with investors are not likely to serve. The experience of energy access to date tells us that these communities will be left behind — as they cannot afford to pay the types of fees that can recover capital costs, ongoing operations, and provide a rate of return. These issues are structural (high ongoing costs, low revenue potential) — they are not barriers that a short-term RBF programme can overcome.

> "We need to stop trying to convince states that the private sector is going to take care of this."
>
> **[OFF-GRID SOLAR PROVIDER]**

58. EnDev. (2024). RBF Projects that Leave No One Behind. https://endev.info/wp-content/uploads/2024/10/241022_RBF_LNOB.pdf.
59. SolarAid. (2026). Light a Village. https://solar-aid.org/bright-solutions/our-programmes/light-a-village/.

Figure 11: Demand curves per income percentiles for representative countries [60,61]



To target EaaS to the customers most in need, geographic eligibility based on poverty levels appears most practical. Communities would be eligible if they have a high proportion of residents above a defined national poverty threshold. For example, this could be based on the national poverty estimates and databases such as the Ubudehe categories in Rwanda, and the "poorer" and "poorest" definitions used in Malawi. Where such definitions do not exist, the latest household survey data could be used to identify the poorest communities. As a second condition, communities that are relatively remote (as measured for example by distance to an electricity grid) would be prioritised. This appears more attractive than defining eligibility on a per-household (rather than per-community) basis, as the EaaS model seeks to serve whole communities, not dispersed households in many communities.

Subsidies would need to be restricted to these eligible communities, so as not to undermine more commercially viable customer segments that can be served by privately financed companies. Given the initial structure of EaaS is likely to involve a high degree of subsidisation and may have limited ability to generate returns for investors, to make the best use of limited public funding it must not compete (with subsidies) in markets which could be served by more commercial business models. For example, while PAYGo has clear limitations, and has struggled to generate many commercially viable firms, it has mobilised significant volumes of finance that reduce the strain on public funding.

The risk of leakage could be managed, especially if there is limited geographical eligibility. Precisely defined zoning to target subsidised EaaS systems only to eligible communities would help minimise the leakage of subsidies to people that do not need them, as well as mitigate risks of market distortion or political challenges.[62] There would remain a risk of customers having their EaaS system installed and that system being stolen or relocated/resold to an ineligible region, but this can be addressed by making it hard to hack systems and through secure installation. Since EaaS customers are offered a guaranteed long-term service, with repairs only carried out within the eligible communities, this may further reduce leakage risk.

60. Greencroft Economics analysis based on World Bank. (2025). Poverty and Inequality Platform. https://pip.worldbank.org/.
61. The analysis assumes a 5% budget available for energy access, which is multiplied by the PIP's variable on average daily per person consumption and by an average household size of 4.8, according to United Nations. (2019). Patterns and trends in household size and composition: Evidence from a United Nations dataset. https://digitallibrary.un.org/record/3908064/files/household_size_and_composition_technical_report.pdf.
62. Lighting Global/ESMAP. (2024). Designing Responsible End-User Subsidies for Energy Access. https://www.esmap.org/OGS_Responsible_End-User_Subsidies_for_Access.

> "If we can get PAYGo right, with private finance, it can nudge into that massive chunk of people currently without access, with an efficient use of public funds. PAYGo is already at massive scale and established, much more than EaaS. But for the part of the market that PAYGO doesn't work for, ultimately, we will need subsidies, and public funding would need to come in at much larger quantities."
>
> **[SECTOR EXPERT]**

> "We are convinced PAYGo and cash can work for a segment of the un- or under-electrified population. Maybe not with huge profitability but at least financially sustainable."
>
> **[FINANCIER]**

7.3. The structure of EaaS for public subsidies

The core question considered here is whether subsidies should be targeted to a specific business unit — for example the initial capital costs or ongoing operating costs. As set out in **Figure 10**, subsidies can address a one-off initial barrier to access, or bridge a fundamental gap between (ongoing) cost to serve and ability to pay, in which case longer-term subsidies are required.

Efficiency aside, there may be reasons to separate upstream (assets) from downstream (operations), in designing funding mechanisms. This could provide a clearer separation of parts of the business that need a high degree of (one off) subsidisation, and a clearer focus on then ensuring high sustainability, with as low a need for ongoing subsidy as needed, in the day-to-day operations.

There could be different ways to structure an EaaS business model, each with pros and cons:

Fully integrated: The advantage is simplicity and having a single operator with an incentive to innovate and be efficient across the value chain. It is notable that the main success stories in the PAYGo sector to date have arguably been such integrated companies, such as Sun King and d.light. Unbundling is certainly not a panacea, so while the bullets below present some clear advantages of unbundling, these should be weighed against the efficiency that a single integrated provider may be able to deliver.

AssetCo and OpCo informally separated in a single EaaS provider: This would entail fully separating the P&L of a business unit which is responsible for acquisition of the initial assets, and a separate business unit that runs all operations once it collects assets at point of delivery in-country. The attraction of this approach is it enables a clear separation of the initial capital cost — which could be highly subsidised by one-off upfront grants — and the ongoing operations. However, it avoids the more costly full legal separation of the AssetCo and the OpCo (see below) and could maintain the advantages of an incentive-aligned integrated service provider (see above).

AssetCo and OpCo fully separated: Taken to its most extreme, the AssetCo and the OpCo could be distinct legally entities with wholly separate ownership structures. This would more easily allow for a separate investor structure into each of the business units, which may help unlock potential for private finance.

> "Innovation is needed, and subsidy on CAPEX is an innovation killer."
>
> **[FINANCIER]**

While separating the AssetCo and OpCo may be better suited to certain types of finance, a key challenge is that neither business unit appears likely to generate the returns that private financiers will expect. The AssetCo may in principle be more akin to long-term infrastructure finance arrangements than the (relatively) short-term capital typically used for energy access ventures. It could also allow for governments to be the owners of the asset base, which is used to meet national electrification plans. However, the major difference with other infrastructure sectors (and how they are financed), is that in other sectors the asset generates a reliable revenue stream that the asset owners (equity) and lenders can make a return on their investment. In the EaaS model, it remains uncertain the extent to which the AssetCo could generate sufficient revenue to provide a return to shareholders or lenders, unless the OpCo generates enough surplus to make payments up to the AssetCo.

The OpCo could then be supported by at least some external financing. Depending on the customer segment served, the OpCo may still need a (well defined, limited, but not necessarily time-bound) operational subsidy, which would increase as it seeks to serve increasingly hard to reach or increasingly low ability to pay customer segments. However, the operating business, if it does not pay for the acquisition of the initial capital stock, could in principle then be covering its costs and potentially generating a margin which could attract external financiers. It would also then match the sort of investment horizons of typical energy access financiers — without needing to wait 10 years or more to see returns.

The separation of the AssetCo and the OpCo could also support a gainshare mechanism between the OpCo shareholders, and the AssetCo. If the OpCo does make profits, these could be shared according to a pre-agreed formula between retained profits in the OpCo, and a "gain share" with payments up to cover some of the initial capital costs sitting in the AssetCo. This would need to be carefully defined, especially so any early-year profits in the OpCo are not immediately bled out to the AssetCo, such the OpCo maintains a healthy reserve in anticipation of higher maintenance and replacement costs in later years as assets come towards the end of their initial life.

While some degree of separation may make sense, and a substantial upfront capex subsidy efficient, it will be important to make sure all parties have strong incentives to perform. Operating companies will be responsible for deploying and servicing the asset base, so they need some ability to influence the selection of, and quality of, the assets to suit the communities they serve. Similarly, the upstream companies and any financiers should be able to see at least some upside to make sure they have an incentive to develop capital that will live up to performance and can generate returns (initially within the OpCo). This will also help maximise the potential for EaaS, as a long-term service model, to drive product innovation and sustainability.

> "There will always need to be subsidies for some customer segments — this is also true in the Western world."
>
> **[DEVELOPMENT PARTNER]**

> "As long as the chosen structure can be generating investable cashflows — e.g. if the assets all subsidised, but the operating company is generating cashflows with a return, that could be investable."
>
> **[FINANCIER]**

"As a private sector operator; what is your skin in the game if you only make USD2 per customer per month? Why stay? The private sector should have skin in the game; if they only do operations, there are no incentives to invest in the country, and operators will lose interest."

[FINANCIER]

7.4. The sources of funding and subsidy levels needed

The most natural funding approach for the lowest ability-to-pay and hardest-to-reach would be government-led initiatives; but it is not clear they have the resources to push EaaS at scale. In countries that have achieved the transition to higher-income status and 100% rates of electrification, the initial cost of extending infrastructure (electricity grids) was funded largely by governments, with privatisation of these assets typically following later. While sub-Saharan African governments have limited fiscal resources to work with, this funding route may be feasible with support from development partners **(see below)**.

Development partners may be a source for some of this funding, in support of governments. Partners such as the World Bank, through the recently launched Mission 300, may be possible sources of concessional finance to support scale up of the EaaS business model. Indeed, this is already being tried at scale in Sierra Leone through the Lite Salone initiative **(see Box 4)**. However, even these sources are relatively limited in terms of the scale that would be needed. Especially in the current context where many development partners are reducing their budget commitments, with a double effect that:

(1) There is less public funding available, and

(2) The public funding that remains available is seeking to achieve as high leverage of private finance as possible.

The EaaS business model is not yet at a point where DFIs would be able to deploy their capital at scale, seeking a (near-) commercial return. Among DFIs that have funded energy access over the past decade, it is unlikely they will commit their balance sheets to a business model that is still unproven and does not appear to offer better commercial returns than PAYGo. This is especially true for harder-to-reach customer segments, where PAYGo itself has often failed to deliver the returns investors expected. There may however be some relatively limited, concessional funding available from DFIs who have funds designed for innovation and testing. Alternative sources of funding could include development partners, philanthropies etc.

"Ideally, you need a government that pays for energy access from tax revenues, but we know that is not going to be the case for many governments.

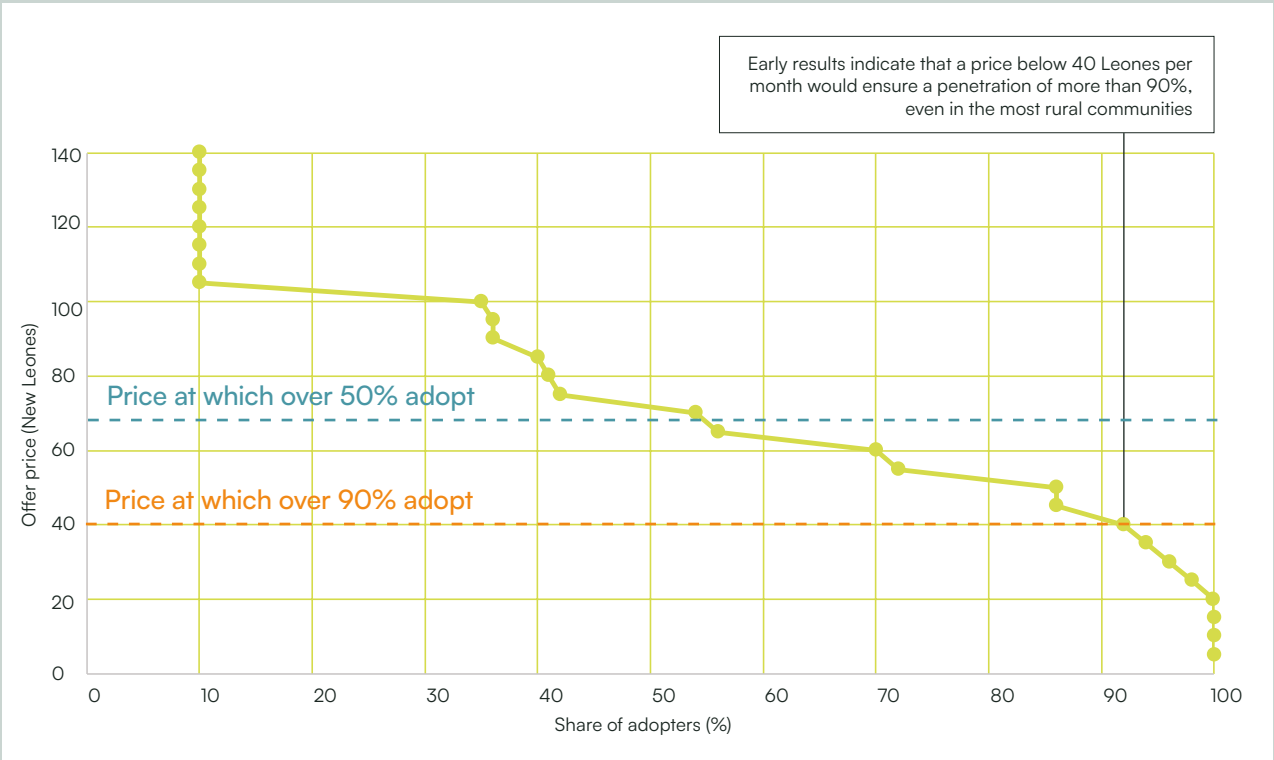
[DEVELOPMENT PARTNER]

BOX 4: RURAL ELECTRIFICATION USING EAAS — A CASE STUDY FROM SIERRA LEONE[63]

Kambia District in northern Sierra Leone is one of the country's most underserved regions, with nearly all its 30,000 rural households living off-grid. Apart from a state-owned generator in Kambia town and seven isolated mini-grids, communities—most of them very small settlements of fewer than 200 households, lack electricity access. Households spend just around USD2.50 per month on candles, batteries and phone charging.

Recognising the limitations of the traditional rent-to-own solar market in reaching a high level of penetration in the most rural communities and in providing long lasting access, Easy Solar partnered with REAL and Irish Aid to pilot an EaaS model in Kambia District. The EaaS model removes upfront costs and offers a Tier 1 (or higher) solar home system for a low monthly service fee of SLE 60 (USD2.50), calibrated to existing household energy budgets. Easy Solar takes care of installation, maintenance, repairs and ongoing customer support.

The pilot has reached 2,100 households so far, and with further funding seeks to reach 15,000 connections by mid-2026. In its current phase, the pilot is being coordinated by Trocaire (an Irish NGO acting as the asset manager) and Easy Solar (operator). Trocaire acts as AssetCo, procuring and owning the systems, supervising financing flows and managing a maintenance reserve fund, while Easy Solar installs and operates the systems with clear KPIs (e.g. penetration rate and usage rates).



Early results are encouraging. The current penetration rate is around 95%, and usage rates up at 89% despite limited mobile-money availability. Repossessions are rare thanks to trusted local agents and strong community engagement. The pilot demonstrates that EaaS can work in small, remote, and low-income communities.

In early 2025, the pilot evolved into the Lite Salone programme, championed by the Government of Sierra Leone under its Mission 300 Compact, which aims to connect 400,000 rural households nationwide.

Community members standing near solar panels, Malawi

Source: Efficiency for Access

8. RECOMMENDATIONS

KEY RECOMMENDATIONS

We make six recommendations to help move the debate around EaaS forward.

Pilots will need to test key elements of the EaaS concept — we cannot afford to wait the ten years that would be needed to fully test out the proof of the EaaS concept and complete at least one full cycle of asset maintenance or replacements. All the recommendations favour continued support for pilots and testing, with data generated on key proof-points for the EaaS business model, to accelerate learnings rather than having to wait for full maturity of a pilot over a 10+ year period. Piloting and generating learnings are all the more important as EaaS seeks to serve otherwise unserved customer segments, for which there is very limited experience and data available to date.

1. Develop more evidence on the cost-effectiveness of life-cycle servicing.

An essential proof of concept for EaaS is in deploying systems which are durable and repairable cost-effectively. This may mean innovating on the hardware and ensuring that repairs and replacements to maintain the asset base can be done cost-effectively. EaaS providers would also be responsible for sustainable e-waste management, where in many energy access deficit settings there is limited e-waste disposal infrastructure. More robust evidence on the cost of repairs, replacements and sustainable end-of-life recycling and disposal could be very persuasive in supporting the EaaS concept.

2. Collect and share robust data on the evolution of costs by key cost centres as scale increases.

This could be organised under agreed KPIs. A key argument for EaaS is that unit costs fall when serving an entire community. This assumption should be tested systematically. Does the cost to serve decrease as penetration and scale increase? PAYGo businesses made similar claims but later found that scale did not automatically reduce unit costs or increase revenue per customer. This data should therefore be collected and challenged.

3. Test price sensitivity to determine optimal pricing.

Continued testing of price points and price sensitivity to better understand what the most efficient price point is that gets to high utilisation without over-subsidising.

4. Pilot options for ensuring interchangeability of OpCos.

Where the EaaS provider may be the single operator for an entire community, clear governance on what happens in the case of underperformance will need to be defined, with feasible (and cost-effective) alternatives able to step if an operator is falling below agreed service levels. This would require an ecosystem of potential operators who could replace one another in any given local context — which would mean systems need to be interoperable across service providers. With multiple operators in similar regions, this may also allow for benchmarking and calibration of SLAs and KPIs (as happens for example for utility scale electricity providers who are often local monopolies but may be benchmarked against other operators in comparable regions serving comparable communities).

5. Clarify what type of funding or financing EaaS needs.

It is not yet clear who could be the funders or financiers, at different stages of maturity of the EaaS and in different market contexts. If it is a pure capex subsidy, and then part of national electrification plans, then what is needed is funding (non-returnable grants), with very limited need for financing (investment capital). If EaaS can generate a return on investment in some parts of the business (e.g. in the operating company, or in the asset company), this needs to be demonstrated, and structures explored that could be attractive to lenders or equity investors.

6. Need to align on key terms and on positioning

There is a broad consensus that EaaS has different advantages to business models used to date. However, different stakeholders are attracted to different elements of EaaS - some prefer terms like “First-Time” electrification to “pre-grid” electrification, and building consensus around the objectives of EaaS would help align to funders interests. Similarly, while EaaS may have some advantages, most funders still see other business models as more commercial, and as (for all their challenges) having reach significant scale, so EaaS needs to find a place within this ecosystem, not as an alternative to it.

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ANNEX 1 — STAKEHOLDER ENGAGEMENT LIST

Table 1: Stakeholder engagement list

#	Organisation	Type	Person
1	Moon	Solar provider	Thomas Samuel
2	Easy Solar	Solar provider	Alex Tourre
3	Spark	Solar provider	Marcel van Heist
4	BBOXX (former)	Solar provider	Andrew Kent, Anshul Patel
5	Ignite Power	Solar provider	Gil Karie
6	PAS Solar	Solar provider	Kristoffer Laurson
7	FRES	Solar provider	Cynthia Kpozuxe
8	Engie Energy Access	Solar provider	Mathieu Brun
9	Hystra	Sector expert	Simon Brossard
10	GOGLA	Sector expert	Drew Corbyn, Eva Roig, Susie Wheeldon, Laura Fortes
11	World Bank	Financier	Esme Sindou, Federico Hinrichs, Thomas Flochel
12	World Bank	Financier	Jan Kappen
13	World Bank / IFC	Financier	Nicolina Lindblad
14	NDF	Financier	Jussi Viding, Isabel Leroux
15	RVO	Development partner / financier	Myrte van der Spek
16	DOEN Foundation	Financier	Maarten Derksen
17	Good Energies	Financier	Stephanie Jones
18	Bamboo Capital	Financier	Christian Schattenmann
19	FMO	Financier	Ward Nusselder
20	BII	Financier	Geoff Manley
21	GIZ Malawi	Financier	Mada Lundu