Financial impact assessment of the Humanitarian Energy Plc minigrid in Sheder refugee camp

Final Report

30 April 2025

MERCY CORPS

HUMANITARIAN ENERGY

UKaid from the British people

Transforming Energy Access

CrossBoundary Advisory

About the report

This study was commissioned by Mercy Corps through its Transforming Humanitarian Energy Access (THEA) programme which is implemented in partnership with Ashden and the Global Platform for Action in Displacement Settings (GPA). The programme is funded with UK aid from the UK government via the Transforming Energy Access platform.

The THEA programme aims to promote more sustainable energy delivery models in humanitarian settings in order to increase access to clean energy solutions for displacement-affected communities. It does so by leveraging a blend of research and evidence-building, data-driven advocacy, and the implementation of market-based energy interventions. By identifying sustainable, inclusive energy delivery models, THEA aims to facilitate their replication and scale up, ultimately enhancing energy access in displacement settings.

The study aims to assess the financial impact of a minigrid in Sheder refugee camp that was installed and is operated by Humanitarian Energy Plc and supported through Mercy Corps' Enter Energy programme.

THEA Partners:

MERCY CORPS

Ashden
Climate Solutions in Action

unitar
United Nations Institute for Training and Research

GPA
GLOBAL PLATFORM FOR ACTION

Funded by:

UKaid
from the British people

Transforming Energy Access

This material has been funded by UK aid from the UK government; however the views expressed do not necessarily reflect the UK government's official policies.

Executive Summary

This report assesses the financial impact of the Sheder minigrid site, developed under the Enter Energy Initiative by Mercy Corps to provide sustainable energy and improve climate resilience for displacement-affected communities in Ethiopia. Ethiopia has a significant displaced population, with over 90% of refugees lacking access to electricity. The Sheder minigrid aims to address this gap by providing reliable, clean energy to refugees and host communities, with over 1,000 connections made to date and plans to serve additional customers.

Key Findings:

1. **Performance Against Targets:** The site has exceeded targets in several key performance indicators (KPIs), including power generation and business customer acquisition. Daily power generation of 616 kWh/day surpasses the target by 23%, but consumption lags behind by around 28%. PUE business customer connections (10) and small businesses (93) far exceed expectations, contributing to long-term revenue potential due to higher energy demand.
2. **Affordability and Customer Satisfaction:** The minigrid provides affordable energy, with 90% of customers reporting lower energy bills, and 80% not feeling financially burdened by payments. However, the significant depreciation of the Ethiopian Birr (ETB) since July 2024 has reduced revenue in USD terms, highlighting the need for a tariff review to ensure financial sustainability.
3. **Revenue and Financial Viability:** Despite the site exceeding most KPIs including revenue (18% above target), devaluation of the ETB has impacted tariffs/revenue in USD terms. A tariff review is needed to offset the impact of currency depreciation and to ensure the site's long-term financial sustainability. Notwithstanding, increased consumption and high average consumption per user (ACPU) from businesses indicate strong demand..
4. **Scalability and Growth Potential:** The site has a strong foundation for scalability due to high demand, particularly from productive use businesses, which contribute significantly to revenue. The high average revenue per user (ARPU) and customer satisfaction (92%) also suggest potential for growth. To scale effectively, Humanitarian Energy should prioritize acquiring more business customers and increasing consumption among existing households.

Executive Summary

Recommendations:

1. **Optimize Revenue:**
    a. Focus on acquiring more business customers, as they have higher electricity demand and a greater willingness to pay. Increase consumption from existing customers, particularly through appliance financing and supporting productive use businesses.
    b. Review tariffs to align with the devaluation of the ETB, considering a universal tariff increase or a tiered structure for different customer segments (businesses and households).
2. **Cost Optimization:**
    a. Conduct a review of operational expenditures (OPEX), particularly staff salaries, and find efficiencies in site visits and corporate overheads to reduce costs.

In conclusion, the Sheder minigrid has demonstrated strong performance and potential for scaling, but challenges such as currency depreciation require a review of tariff structures and cost-saving measures to ensure long-term viability.

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Context

- Global forcibly displaced populations **lack access to sustainable energy** and face significant climate risks
- This growing demographic presents a market opportunity to develop **sustainable solutions for communities and organizations**
- To address the gap, Mercy Corps has developed the **Enter Energy Initiative** – utilizing public-private partnerships to provide access to sustainable energy and improve climate resilience in displacement-affected communities
- Ethiopia has a significant displaced population who continue to lack access to modern energy sources – thus as part of this initiative, Mercy Corps cofounded Humanitarian Energy PLC) with Rensys Engineering and Trading, to launch Ethiopia's **first commercially licensed private solar PV minigrid**
- The 254kWp minigrid has >1000 connections and the potential to serve additional customers providing **clean, reliable, sustainable energy at an affordable cost**

Objectives

Mercy Corps has engaged CrossBoundary to conduct a financial impact assessment of customers connected to the minigrid to answer two fundamental questions:

1. Do the projects deliver electricity or other energy services to the target community at an **affordable tariff or price**?
2. Are the **models cost-effective for scaling**?

This will be achieved by:

- Evaluating minigrid's current performance by assessing key KPIs against target KPIs
- Exploring key trends relating to the minigrid's performance and using these to evaluate scalability
- Identifying opportunities for performance improvement at the existing site

Summary of key findings

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The Sheder minigrid site currently serves over 1,000 customers, including Refugee Households, Businesses, and Social Institutions

Sheder Site Overview	
Location	Sheder, Ethiopia
Capacity	254 kWp
Technology	Solar and BESS
Commissioning Date	May 2024
No. of connected customers	1,135*
Customer demographics	• Refugee Households - 1027 • Refugee Businesses – 93 • Social Institution – 5 • PUE Hub Businesses - 10

* Customer connections as of 31 March 2025

CrossBoundary conducted analysis on the Sheder site assessing performance across the following KPIs

KPI	Description	Target	Current Average	Status
1	% of connected HHs engage in regular payments for energy products and services	70%	82%	
2	# of signed contracts	HH/Business -1,579 PUE Hub Businesses[3] - 6	HH - 1,027; Business - 93 PUE Hub Businesses -10	
3	Average daily power generation for the grid overall	Y1 – 500 kWh/day	616 kWh/day	
4	Average daily power consumption for the grid overall	Y1 – 434 kWh/day	443 kWh/day	
5	Customer challenge rate	N/A	16%	
6	Issue Resolution	75% of challenges resolved	100% resolved	
7	Customer satisfaction and service rating	3 or above out of 5	92% rate above 4/5	
8	Over-indebtedness of customers (payments not creating a heavy burden, changing food consumption patterns, causing stress	<10% experience 'heavy' burden	4% experience heavy burden	
9	Reduced energy spending	75% of customers spend less	93% spend less	

1. Applies where there a KPI includes two components with separate targets
2. KPIs indicated for period starting in June 2024 and ending in March 2024
3. Refers to businesses located at the PUE hub

Exceeds KPI target

Partially exceeds KPI target[1]

Below KPI target

Methodology

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This report was developed through a three-step process involving collecting site and customer data collection, data analysis and a synthesis of key insights

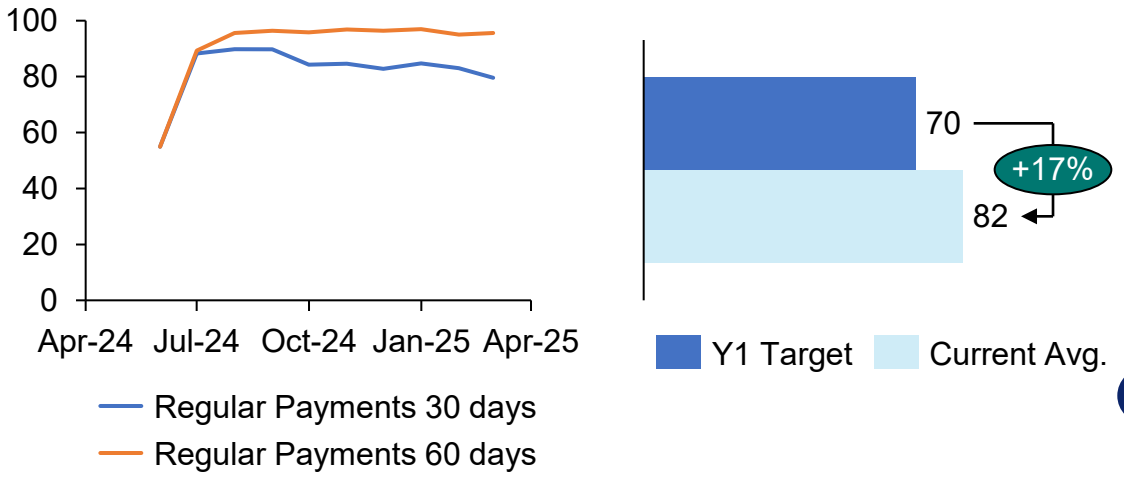
	1 Data Collection	2 Data Analysis	3 Synthesis and Recommendations
Approach	Gathered information on site and existing customers leveraging a range of data sources (survey data, technical management tools, customer service database etc.)	Calculated KPI metrics and compared via target metrics and conducted benchmarking against minigrid sites in Sub-Saharan Africa	Synthesized insights and developed final report for internal and external engagement
Deliverables	• Raw anonymized data in Excel file including survey data output to be shared with Mercy Corps	• Not Applicable	• Cost-effectiveness assessment report and slide deck outlining approach and key findings from engagement, including identification of pathways to enhanced viability
Participants	HUMANITARIAN ENERGY; CrossBoundary Advisory	CrossBoundary Advisory	CrossBoundary Advisory

KPI Assessment

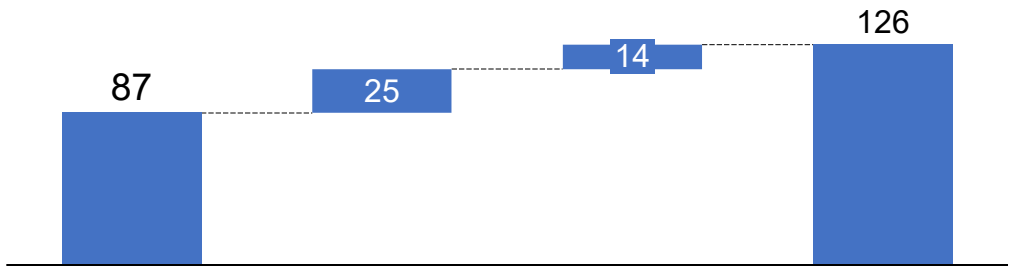
CrossBoundary Advisory

~82% of connected HH customers have completed a payment in each month indicating widespread acceptance of the minigrid

% of HH engaged in regular payments



Inactive Customers [1]



Description of data & source:

Measure of customers who completed at least one payment for electricity within each month (between July 2024 and January 2025).

Data received from Humanitarian Energy management. Based on OPEX Management tool which includes prepaid or postpaid payment records.

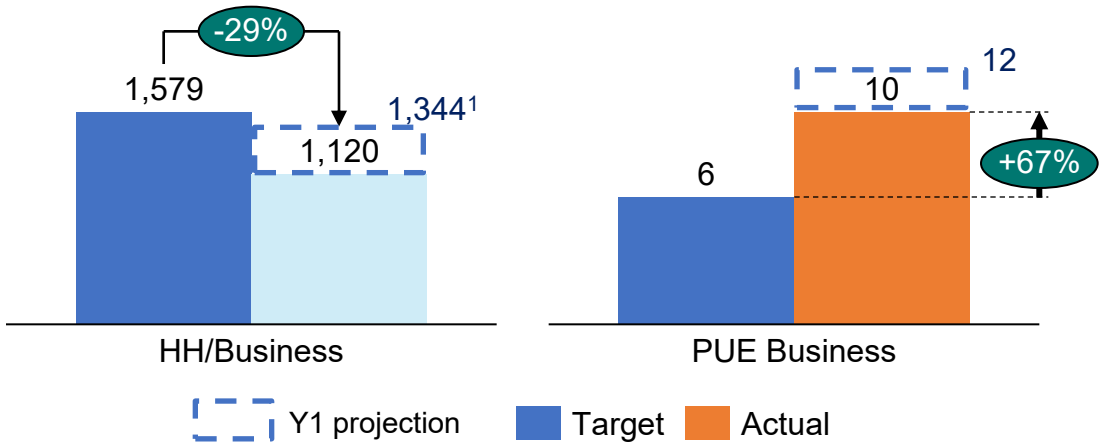
Key Takeaways

- A significant number of household customers (82%) engaged in regular payments (i.e. within 30 days) suggesting widespread acceptance of the minigrid - this figure increases to ~91% when considering customers who completed one payment every 60 days
- The high payment frequency suggests service reliability and business model viability (i.e. a large pool of customers with the ability and willingness to pay for continued service from the minigrid)
- Conversely, ~9% of customers were considered to be inactive – this includes customers who did not make any electricity payment within the period specified (i.e. 30, 60 and 90 days) and who did not consume any electricity during this period
- This might be indicative of a subset of customers who may be burdened financially and unable to sustain payments

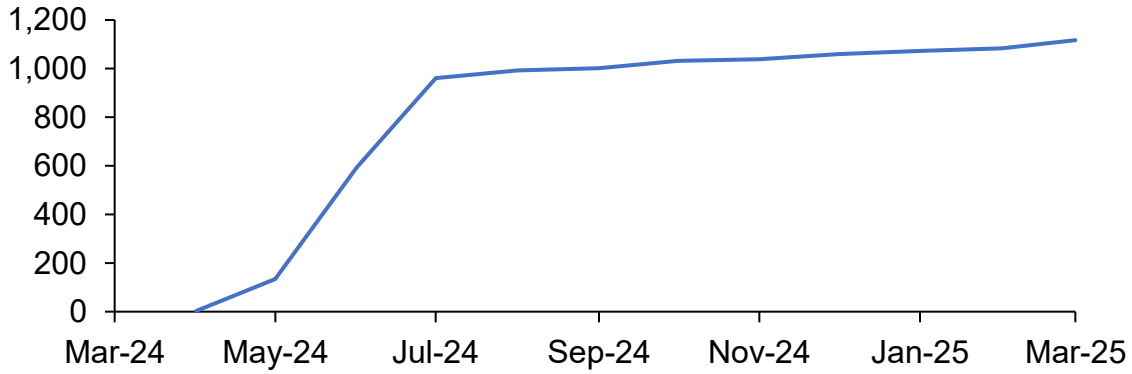
1. Inactive customers defined as customers who did not purchase electricity and whose consumption reduced to zero

Despite trending behind the HH target, the site is oversubscribed by businesses which may translate to favourable economics

Number of signed contracts



Customer Acquisition



Description of data & source

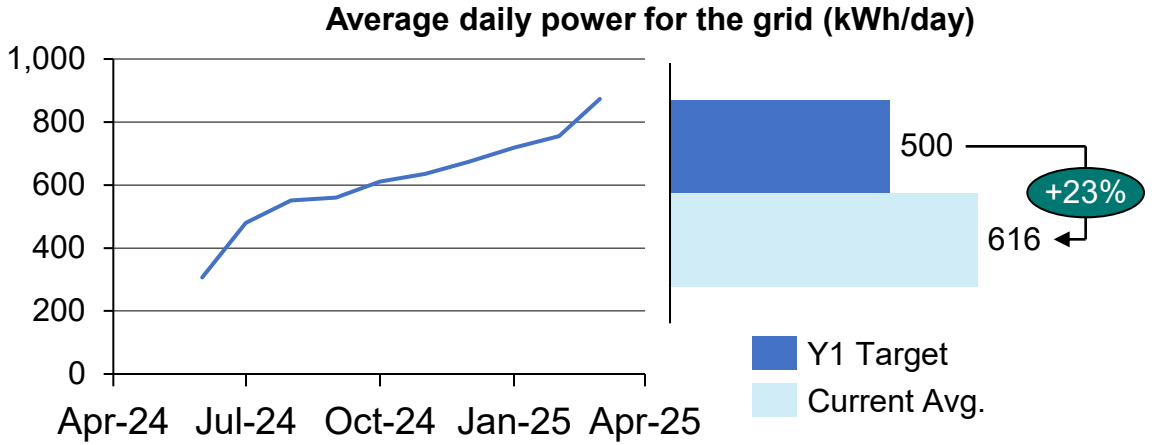
Measured as the total number of individual customer connections to the minigrid (typically one per household or business).
Based on the management's record of executed contracts as of March 2025.

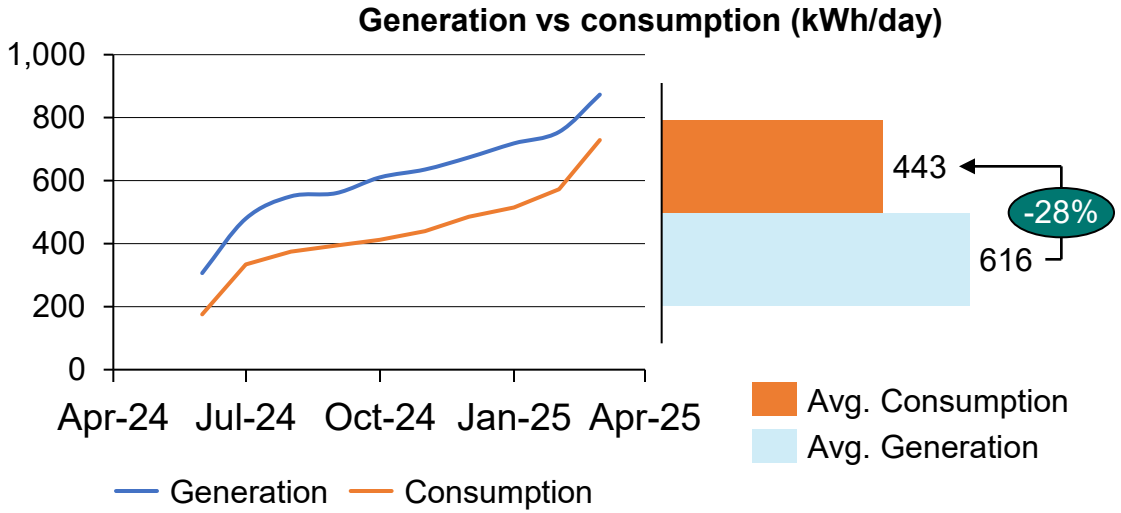
Key Takeaways

- The minigrid has entered contracts with 1,120 customers, including 1,027 households and 93 small businesses, approximately 29% less than its overall HH target (1,579)
- This contrasts with business operating within the PUE Hub who are oversubscribed to the minigrid – to date, the minigrid has entered contracts with 10 of such businesses (67% above target)
- A relatively high number of business customers signals positively for the long-term revenue potential of the minigrid due to businesses' greater energy demand and propensity to pay as compared to households
- The HH shortfall was attributed to:
  - Connection sharing between households leading to under-reporting of HH connections
  - Overestimation of the HH target due to shifts in the refugee population after customer surveys

1. Based on projections by Y1

Daily power generation exceeds target levels; however, consumption lags generation by ~30% driven by losses





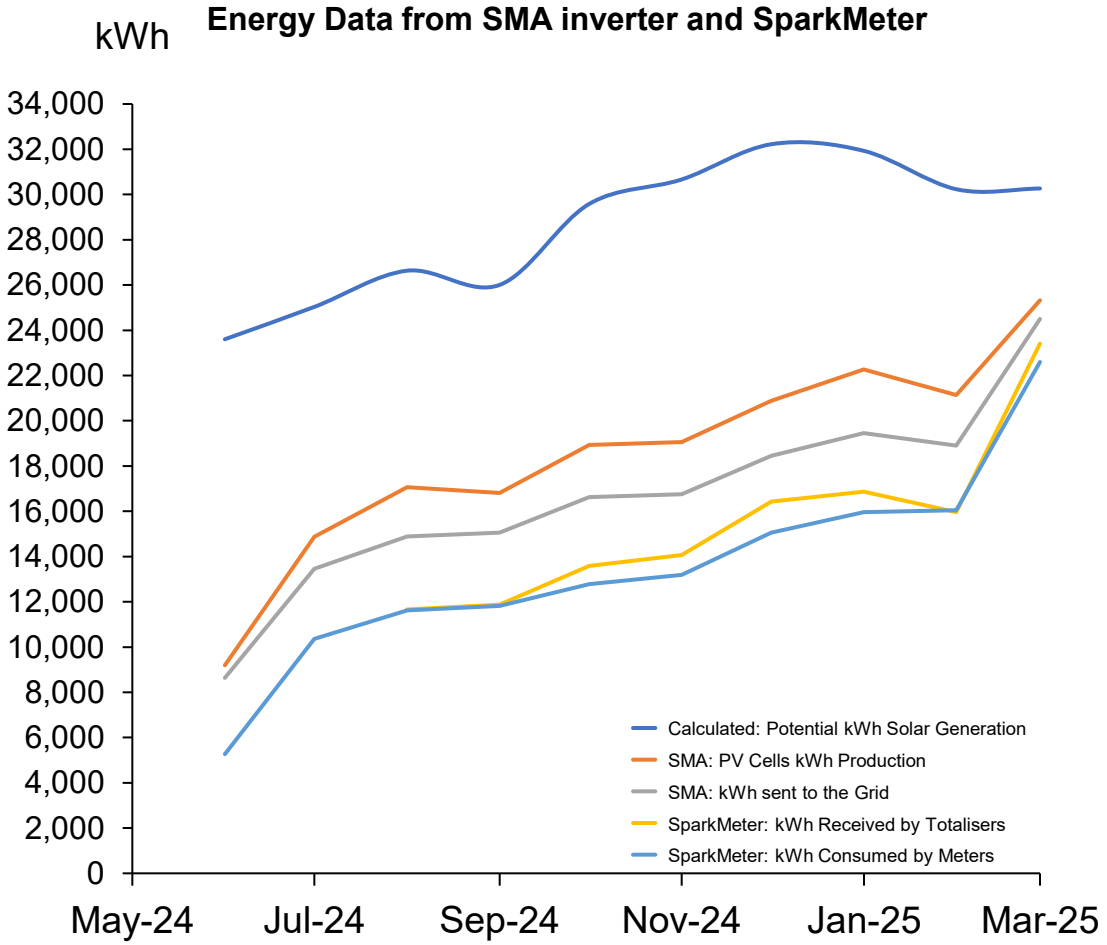
Description of data & source:

Measure of the daily power generated by the mini-grid.
Based on readings returned from the API Integration indicating inverter and meter data.

Key Takeaways

- The average daily power generation between June 2024 and March 2025 was 616 kWh/ day, exceeding the target generation (500 kWh/day) by ~23%
- However, average daily power generation exceeded daily consumption by ~28% (3x greater than expected 10%), likely due to losses from the initial ramping up period:
  - The extent of losses has been established in the coming slides.
  - The ramp-up period brings down the average, whereas March 2025 saw an 83% site utilization.
  - Utilization of the mini-grid has been increased through customer acquisition and promoting income-generating activities/bringing online productive loads across the customer base.

The site is operating efficiently in just nine months and is steadily moving towards the theoretical limit of the site's solar generation potential



Description of data & source:

SMA Inverter:
- **PV Cells Production:** Total solar energy produced.
- **Energy Sent to Grid:** Energy exported to the grid.

SparkMeter Smart Meters:
- **Totalisers:** Energy received at grid points.
- **Meters Consumption:** Customer energy usage.

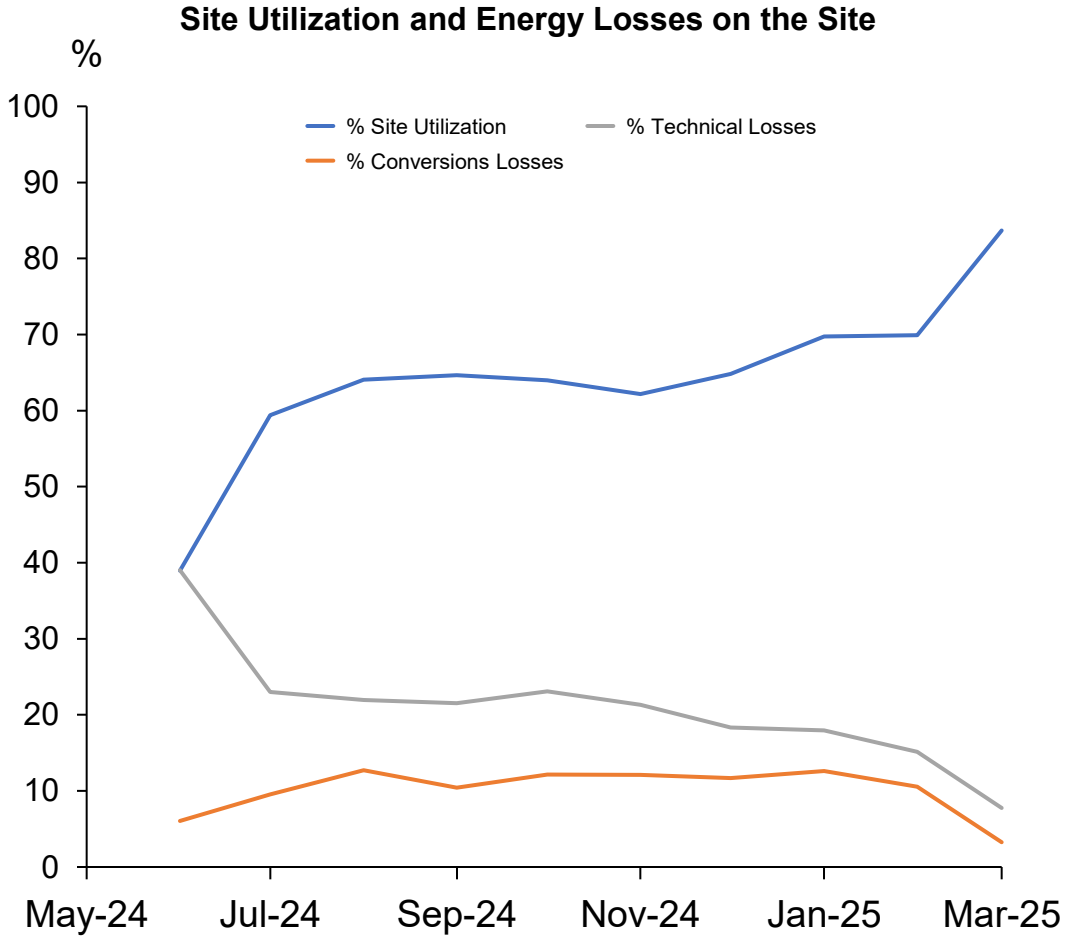
Calculated Potential Generation: Estimated solar output (using Solar Atlas data, location, installed capacity, and assuming 30% losses).

Note: There was a notable delay in capturing full data until totalizers were fully operational in August 2024.

Key Takeaways

- Initially, significant losses occurred, as indicated by discrepancies between energy sent to the grid and consumption.
- After August 2024, energy consumption data steadily approached potential generation, indicating improved system performance and reduced losses.
- By March 2025, individual meter consumption closely aligns with PV production, highlighting reduced losses and improved operational management.

90% of generated energy now reaches customers showcasing the operational efficiency gains made at the site



Description of data & source:

Metrics Calculations:

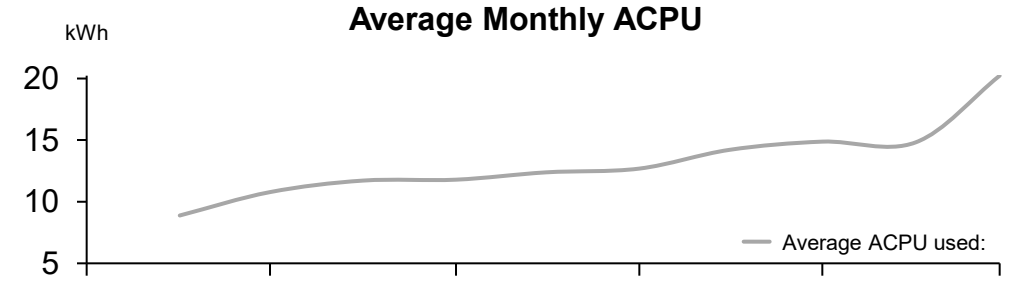
- **Site Utilization:** (Individual Meter Consumption from SparkMeter / Potential Solar Production) × 100.
- **Conversion Losses:** [1 - (Grid Consumption from SMA / PV Production from SMA)] × 100.
- **Technical Losses:** [1 - (Individual Meter Consumption from SparkMeter / Energy Sent to Grid from SMA)] × 100.

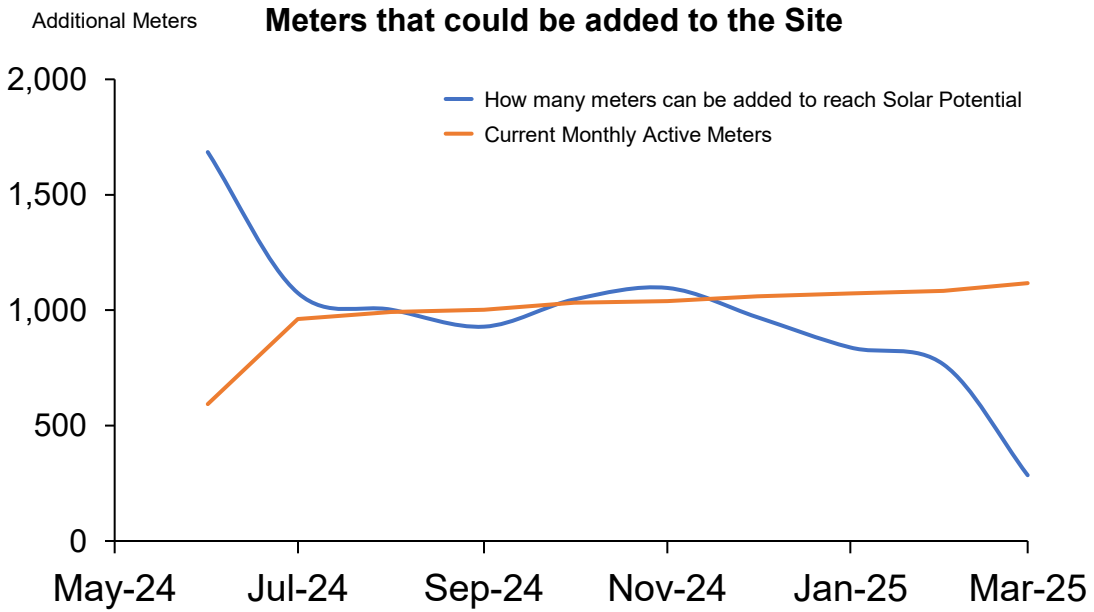
Key Takeaways

- The site is nearing full utilization by March 2025, with only 17% unused capacity in March 2025[1].
- The site exceeds typical mini-grid utilization. CrossBoundary research indicates average utilization of 27% from 10 sites across Kenya, Zambia and Nigeria between 2020 and 2023[1]. This site achieves an exceptional 64% site utilization over the reporting period.
- Technical and Conversion losses have steadily decreased, reflecting improved operational efficiency.

1. Higher consumption observed in March was due to Ramadhan

With 40 additional meters, the site will have reached its full capacity in March 2025





Description of data & source:

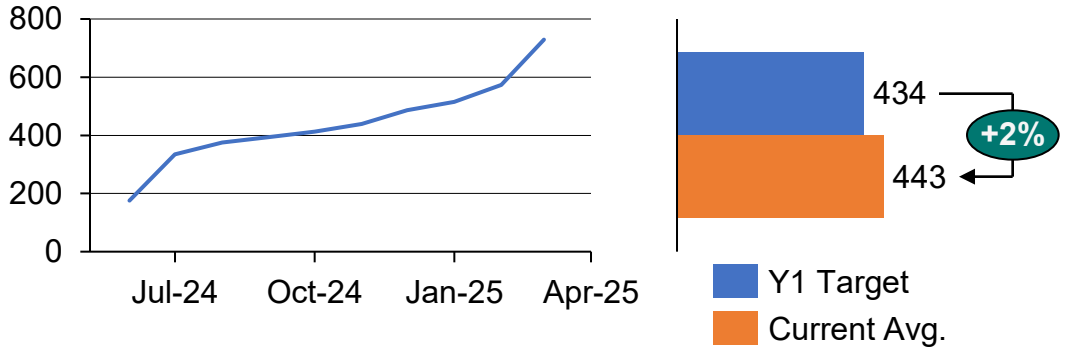
- **Average ACPU (Average Consumption per User):** Monthly kWh consumed per customer.
- **Additional Meters Based on PV Production:** Number of additional customer connections possible based on actual PV production.
- **Additional Meters Based on Solar Potential:** Number of additional customer connections possible if full potential PV production is realized.

Key Takeaways

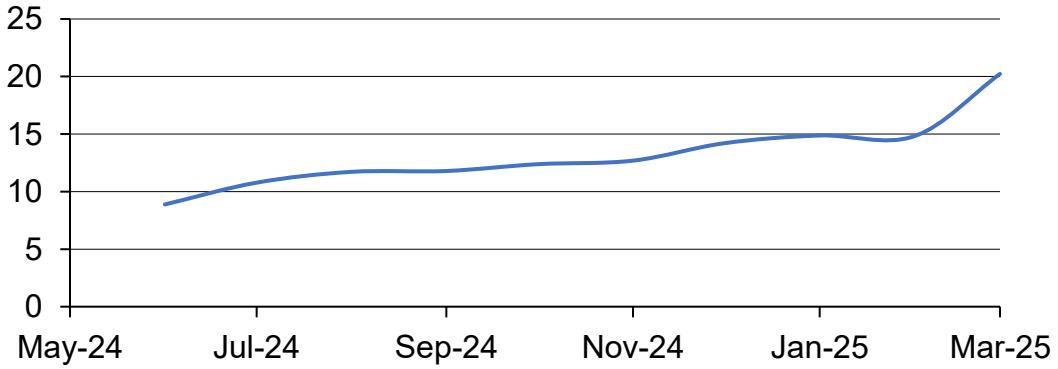
- Based on the average consumption per user (ACPU), the site could only support an additional 284 meters in March 2025
- Given that there were 1135 active meters as of March 2025, an additional 289 meters would bring the total to 1424, falling short of the target of 1570 connections.
- Given the high ACPU on the site, this target would be hard to reach with the current mini-grid size
- This illustrates the opportunity to add additional customers if the site increases its solar energy capture and further improves its distribution efficiency

Consumption at the Sheder site is currently above the target level demonstrating strong consumer demand

Average Daily Consumption (kWh/day)



Average Consumption Per User (kWh/month)



Description of data & source

Measure of total daily consumption from connected minigrid customers.

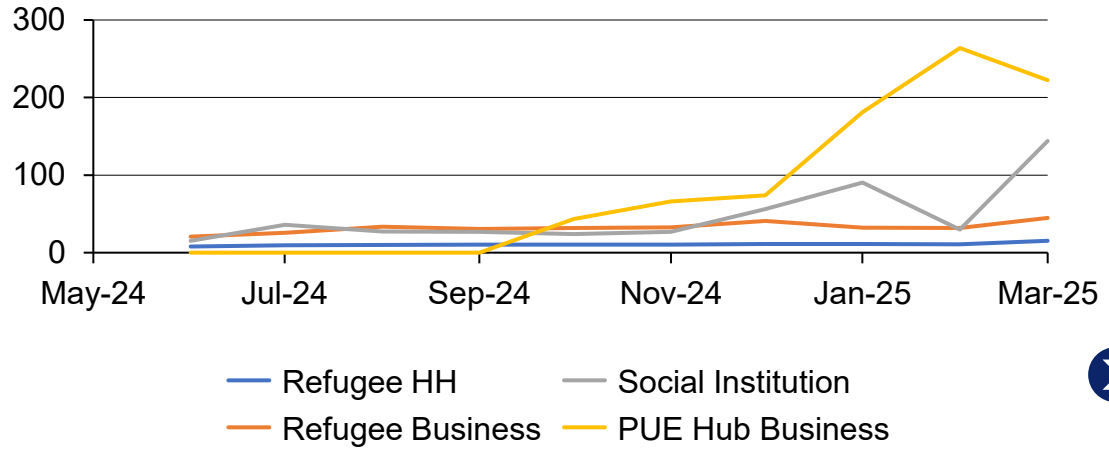
Based on readings from SparkMeter.

Key Takeaways

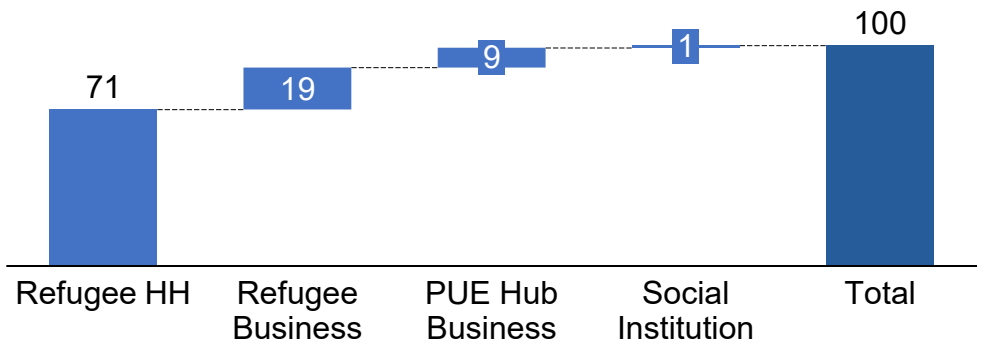
- Average daily consumption at the Sheder site currently stands at 443 kWh/day exceeding the Y1 target (434 kWh/day)
- The site's Average Consumption Per User (ACPU) has steadily increased over the last six months further indicating the Sheder site has a viable customer pool with increasing electricity demand.

Although HH customers account for ~70% of overall consumption, PUE hub and refugee businesses have driven consumption on a per user basis

Average Consumption Per User (kWh/month)



Consumption % by customer type[1]



Description of data & source

Measure of total daily consumption from connected minigrid customers.

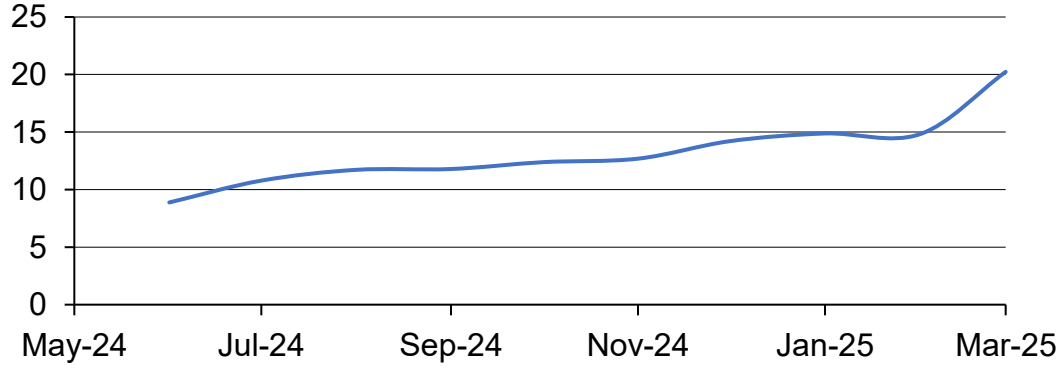
Based on readings from SparkMeter.

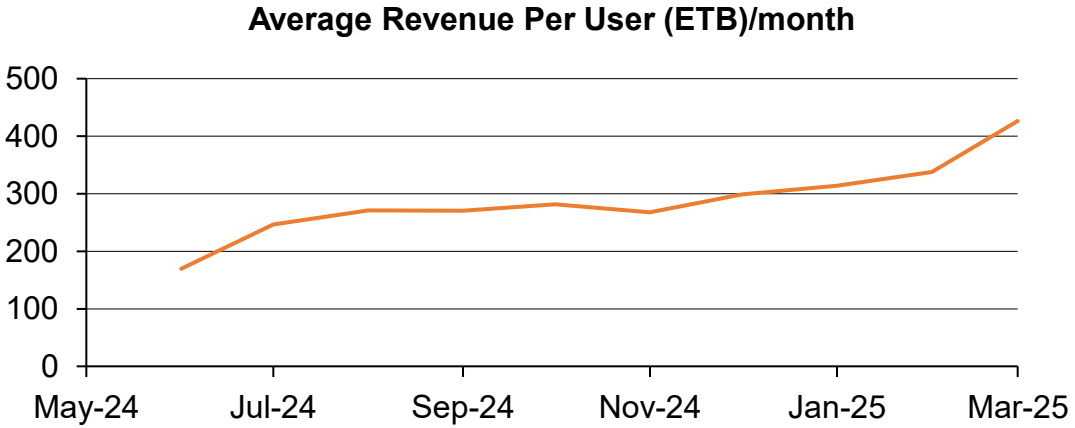
Key Takeaways

- PUE Hub businesses consume significantly more electricity than any other user with an average ACPU of 144 kWh/month from October - this contrasts with Refugee Business (36 kWh/month) and Refugee Households (11 kWh/month) over the same period
- Refugee Households have the largest overall electricity demand of customer segments

1. Consumption split indicated from October 2024 to align with available data from PUE Hub businesses

ARPU saw steady growth until February where a sharp increase is observed mirroring the ACPU trend





Description of data & source

Measure of average revenue per user (ARPU)

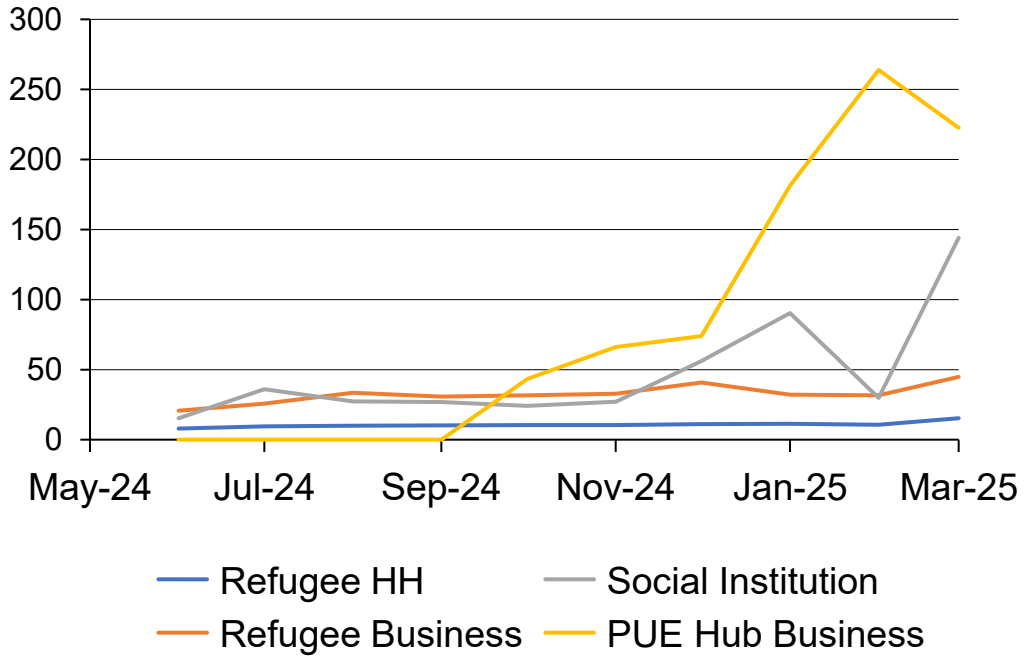
Based on the management's records of electricity sales and number of connected customers

Key Takeaways

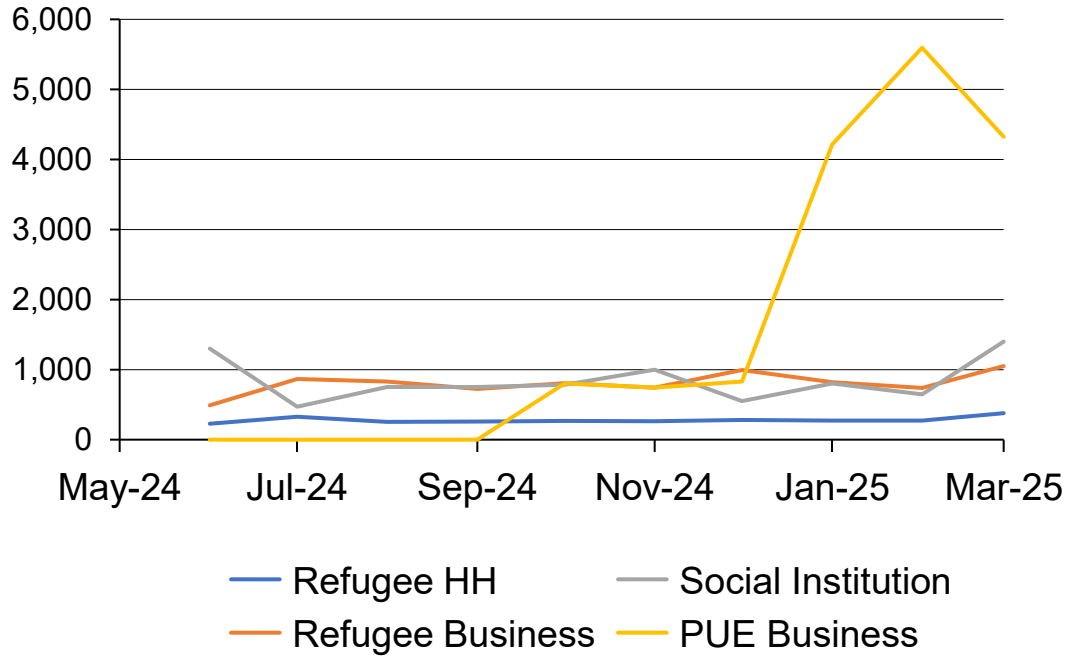
- ARPU (exclusive of connection fees) at the site has steadily increased in line with ACPU
- The sharp increase in ACPU/ARPU between February ad March reflects strengthening underlying consumer demand
- Humanitarian Energy can further increase ARPU by:
  - i) Adding more productive loads and supporting scaling of existing productive use consumers (e.g. by providing linkages to microfinance/credit providers and access to appliances)
  - ii) Increasing consumption from existing households through appliance financing (NB: Mercy Corps and Humanitarian Energy are currently conducting a clean cookstove pilot to increase consumption for this segment of users)

At the customer level, ARPU is predominantly driven by electricity sales to refugee and PUE businesses also mirroring the ACPU trend

Average Consumption Per User (kWh/month)

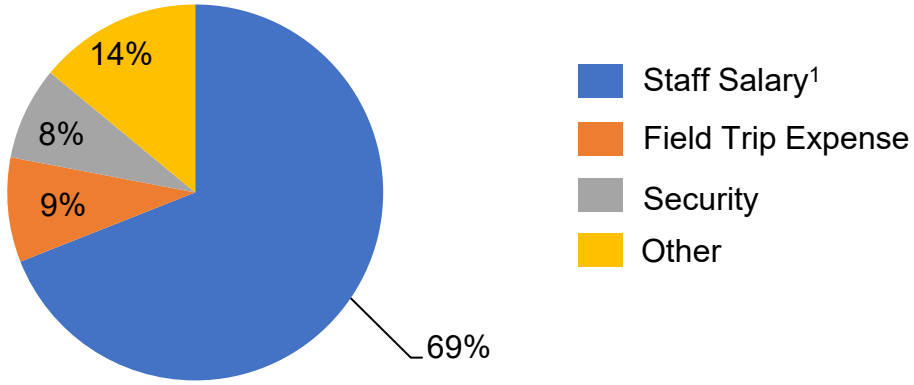


Average Revenue Per User (ETB)/month

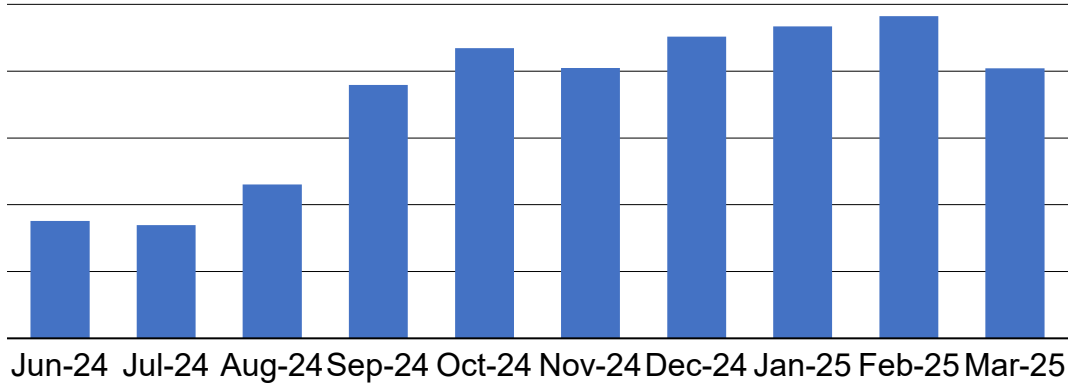


Operating expenditure has steadily increased with staff salaries contributing the greatest share of total expenditure

Operating Expenses Breakdown (ETB)



Operating Expenses (ETB)

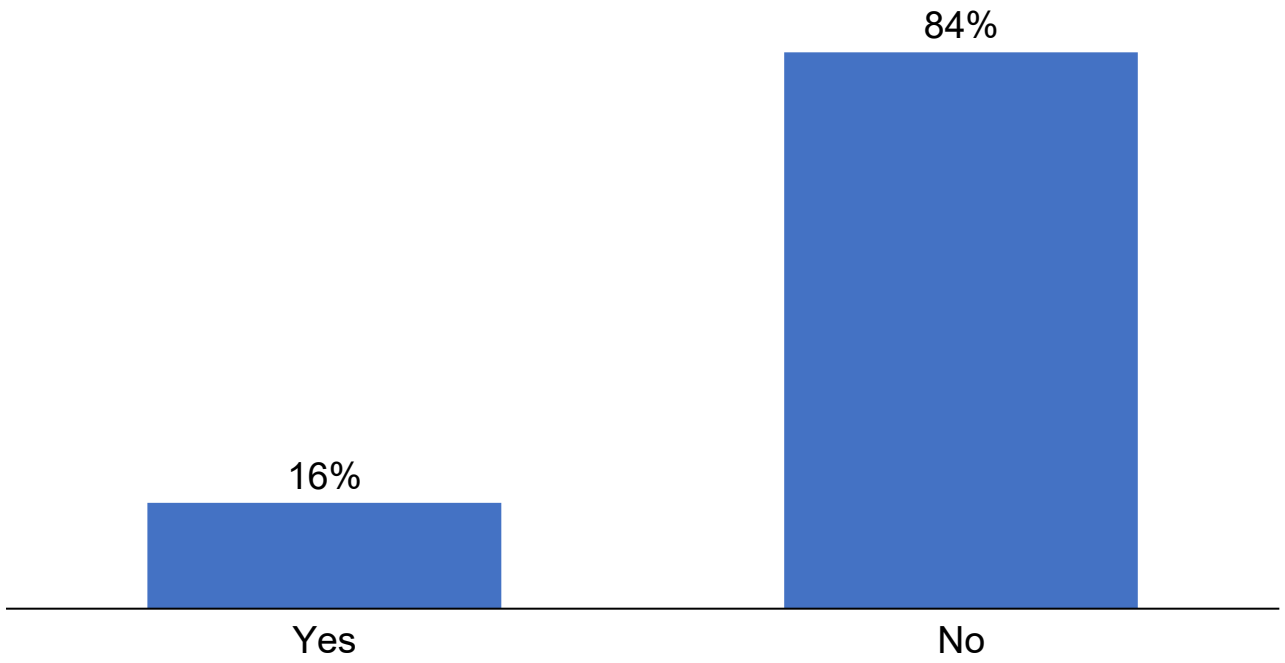


Operating expenditure at the site is approximately within budget (>1% Y1 Target) in ETB terms, but costs have risen steadily driven by USD denominated costs. Staff salaries was the largest contributor to OPEX and included salaries for full time staff, field officers and technicians. USD-denominated staff salaries appear to have increased OPEX disproportionately due to the currency devaluation.

1. USD-denominated staff salaries appear to have appreciated in ETB terms contributing to the increased OPEX at the site

Most surveyed customers reported that they have not experienced any challenges using the minigrid during its eight months of operation

Q: Have you experienced any challenges using the Humanitarian Energy PLC minigrid services?

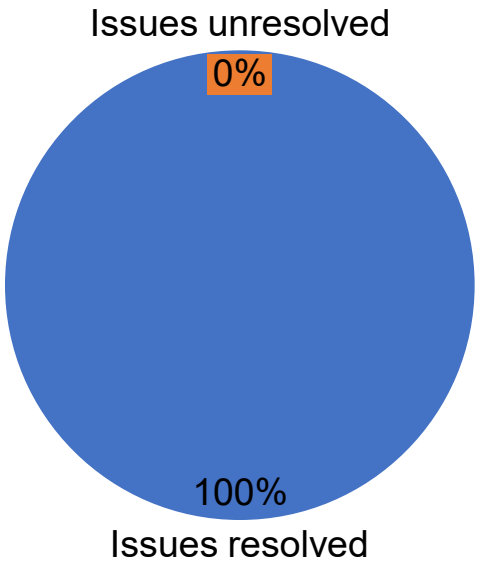


"If you get an outage, it is hard to find someone to fix it as the staff number is not enough for the whole camp. When the light goes out due to prepaid balance depletion, there is a delay to recharge because of limited number of staff members"

- Customer

Challenges at the site have been promptly resolved reflecting in a 100-percent issue resolution rate

Issue Resolution rate (%)



The site has encountered limited system challenges since beginning operations in June 2024

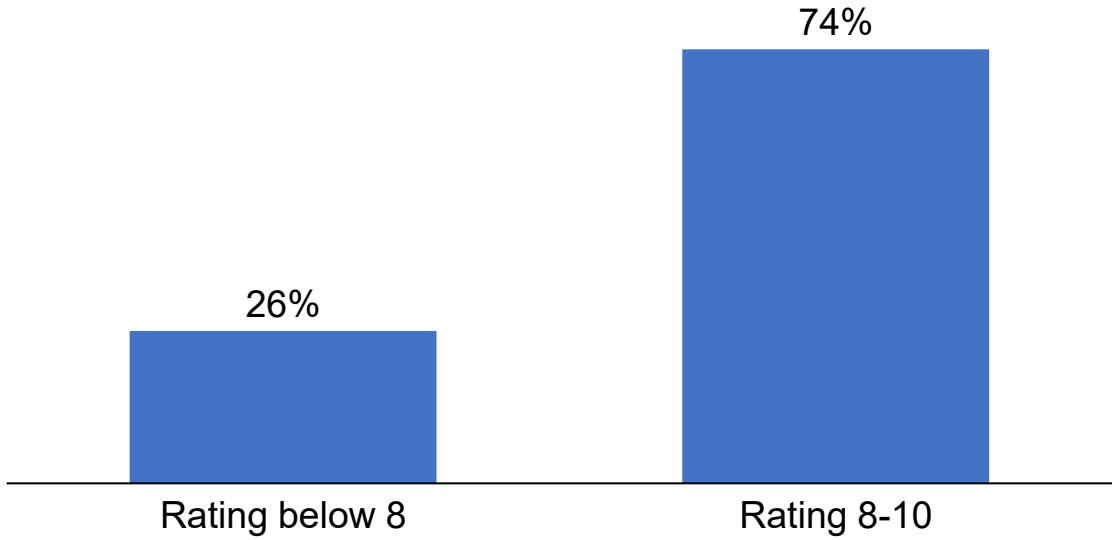
Key issues have been promptly addressed:

- **System outage** resolved within 30 minutes
- **Firmware challenges** impacting meters promptly escalated to supplier

(NB: the supplier is actively working to completely resolve firmware challenges caused by a firmware update; considering this is an external supplier issue, it is considered resolved from a Humanitarian Energy perspective)

With an NPS of 45 and over 70% of customers indicating a rating of 8/10 or more, the Sheder site can be considered to have a solid base of loyal and satisfied customers

Q: On a scale of 0-10, how likely is it that you would recommend the Humanitarian Energy PLC minigrid services to a friend, where 0 is not at all likely and 10 is extremely likely?



Net Promoter Score: 45

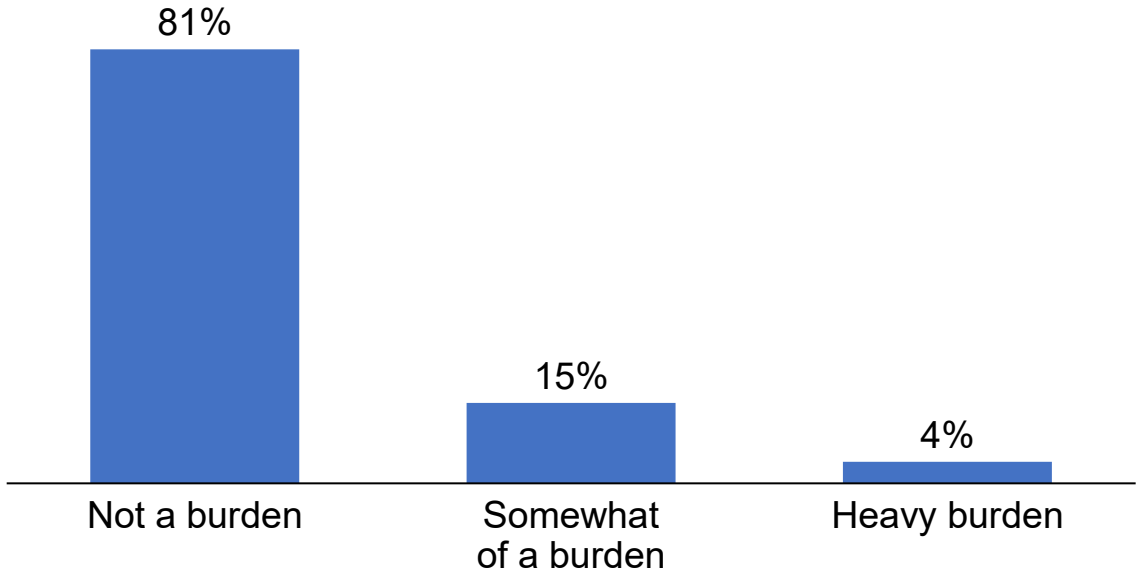
"Humanitarian energy minigrid has improved my life by providing reliable electricity which has enhanced access to essential services like communication. It has improved lighting and power access."
- Customer

My children utilize the light for reading their books. We did not have electricity before the energy grid arrived. We were in dark homes without any light. The generators that we were using previously were turned off from 9:00 pm
- Customer

1. Net Promoter Score is a proprietary indicator by 60dB that assesses customer satisfaction and loyalty

Four in every five customers indicated that their electricity payments have not presented a financial burden – this serves as indication of potentially long-term usage

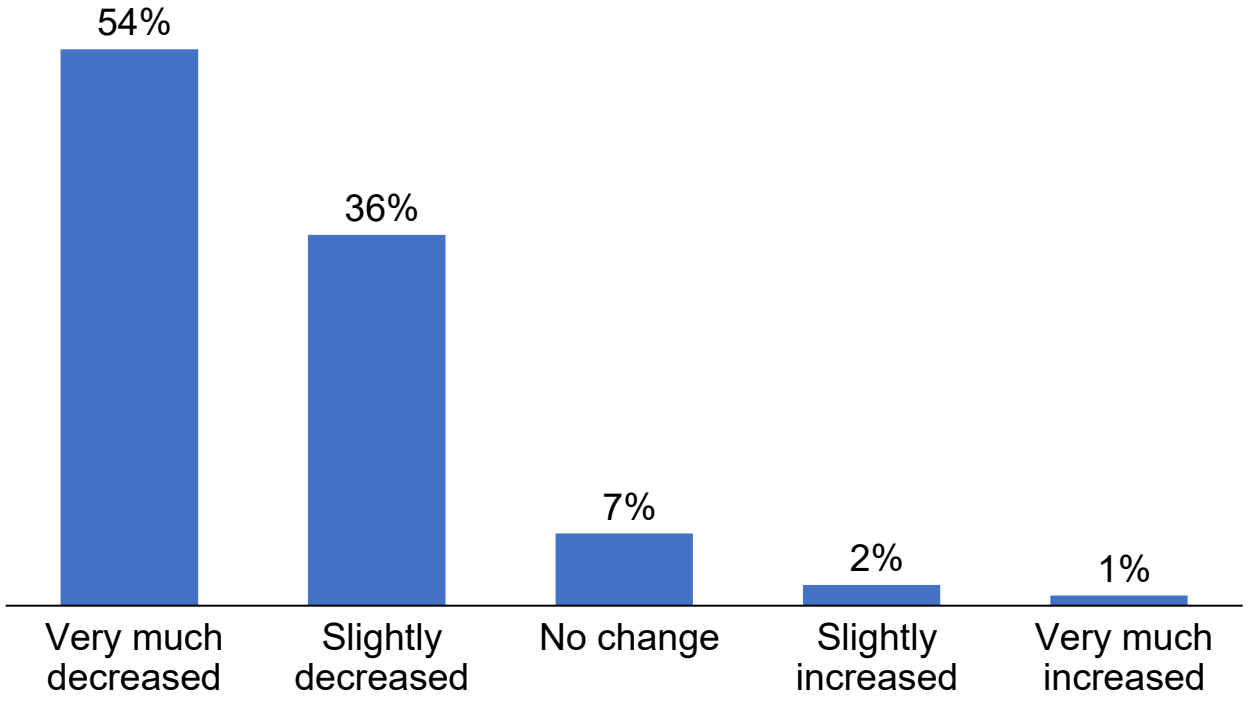
Q: Thinking about your minigrid services payments, are they a heavy burden, somewhat of a burden, or not a problem?



"Their billing is transparent, no hidden fees. The staff explained every charge in Somali, and I now know the budget very well. I tell my neighbours, no more guessing worries with bills"
- Customer

90% of surveyed customers have experienced reduced energy spend using the minigrid further highlighting the viability of the customer pool

Q: Has your average weekly spending on lighting and/or energy changed because of access to the minigrid services?



"The minigrid solar is cheaper than the generator. I used kerosene lamp when the generator was not available but now lighting in my house is always available due to the minigrid solar provided to us by Humanitarian Energy"

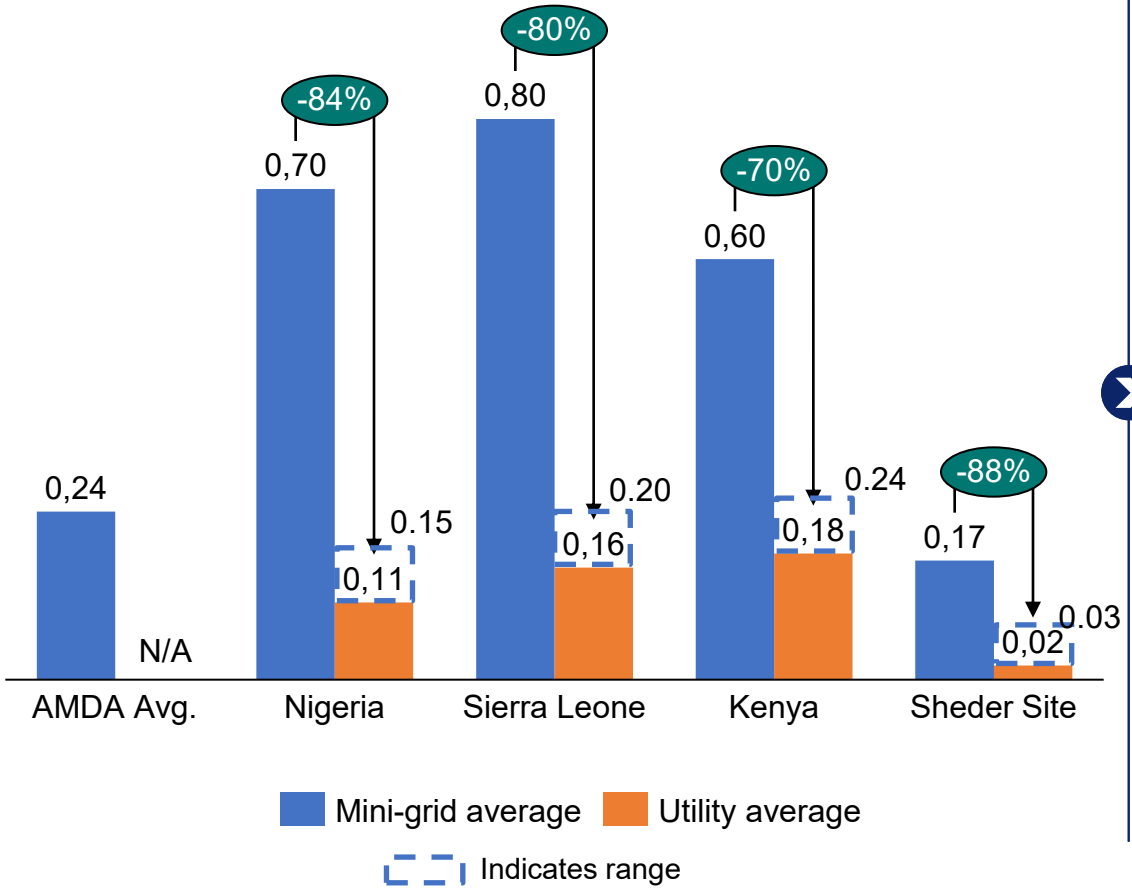
- Customer

Site benchmarking

CrossBoundary Advisory

The Sheder site has considerably lower tariffs when compared to other Sub-Saharan markets, mirroring the trend observed with utility tariffs

Average tariff on baseline consumption[1] ($/kWh)



Description of data & source

Tariffs paid by customers. Blended day and night-time tariff indicated for the Sheder site.

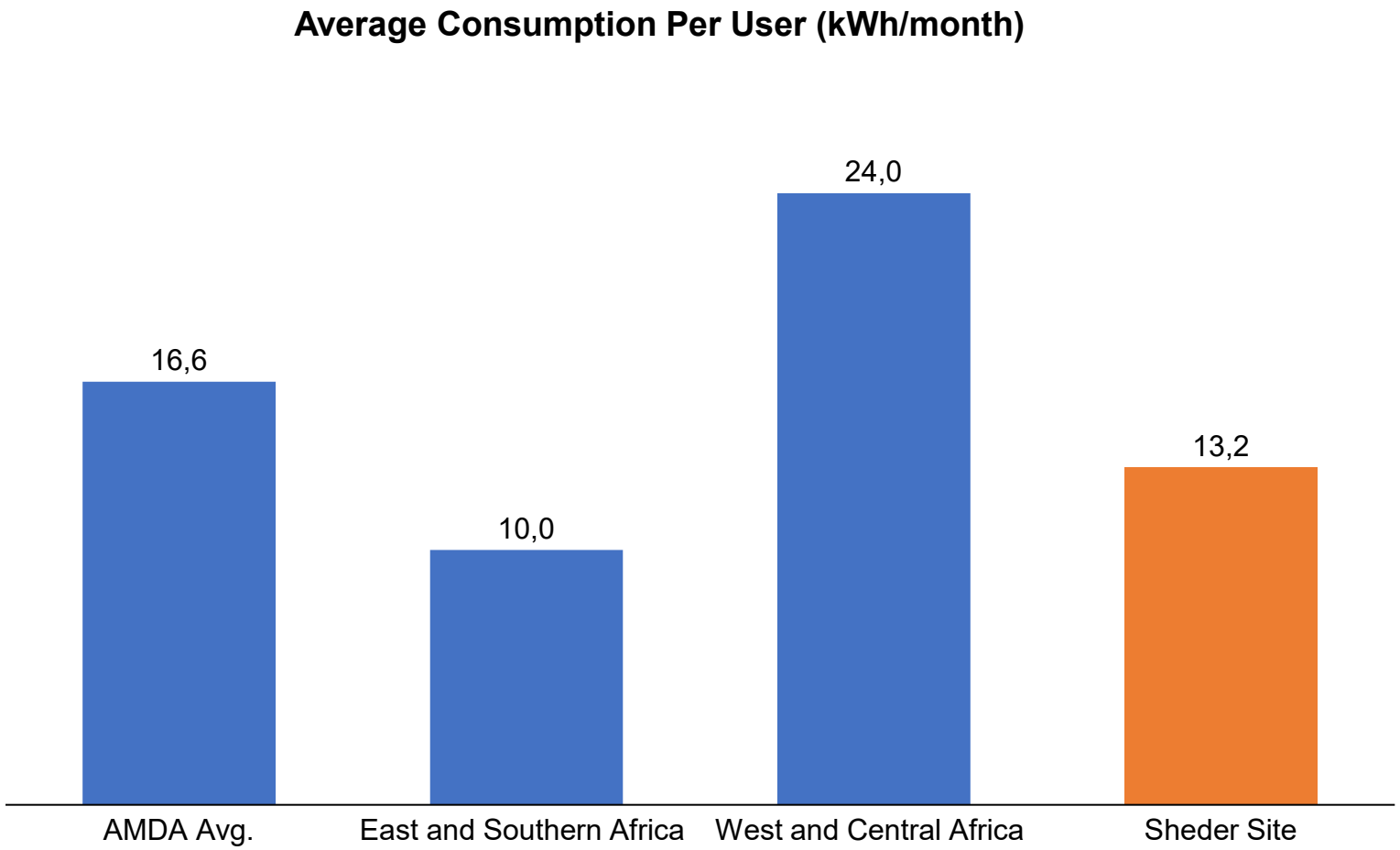
Based on the management's records.

Key Takeaways

- Benchmark data show that the Sheder site has significantly lower tariffs when compared to sites in other countries.
- Ethiopia has amongst the lowest electricity prices in the world due to significant government subsidies
- Utility tariffs in Ethiopia are 80-90% lower than the Sheder site tariff – this is comparable to the variance observed in Nigeria and Kenya although considerably more than Kenya

1. CrossBoundary Minigrid Innovation Lab data (2023)
2. AMDA average includes data from Nigeria, Kenya, Uganda, Sierra Leone, Togo, Zambia, South Africa, Somalia, Benin, Mozambique, Madagascar and Cameroon

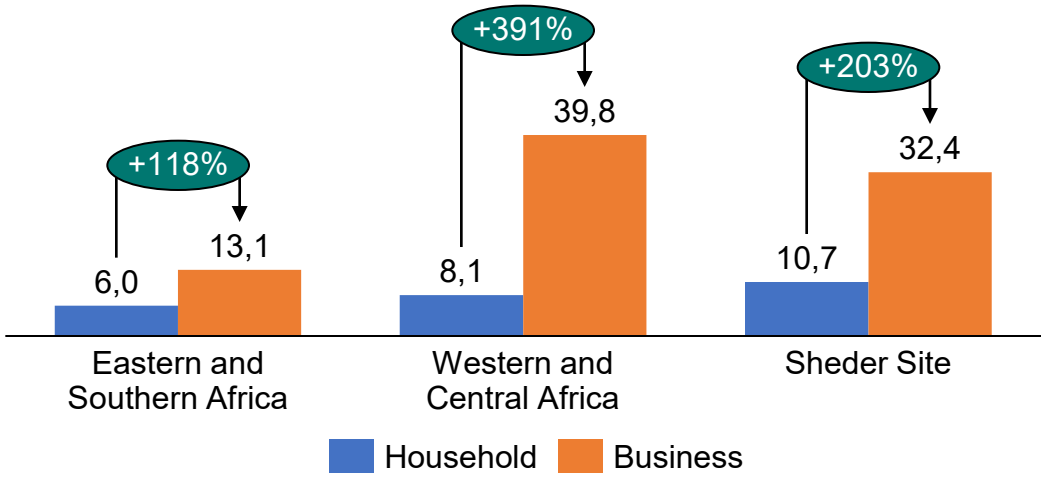
Consumption at the Sheder site is higher than the East and Southern Africa average, albeit lower than in West and Central Africa where consumption is generally high



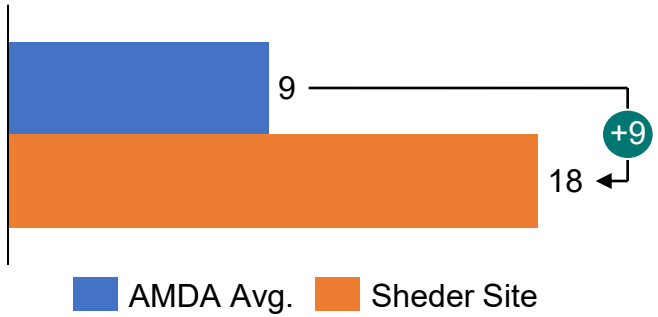
1. AMDA average includes data from Nigeria, Kenya, Uganda, Sierra Leone, Togo, Zambia, South Africa, Somalia, Benin, Mozambique, Madagascar and Cameroon

ACPU at the site is predominantly driven by business customers who consume more electricity than counterparts in Eastern & Southern Africa

ACPU per month by customer type (kWh/month)



% of consumption from business users



Description of data & source

Measure of consumption by customer type.

Consumption is based on SparkMeter data.

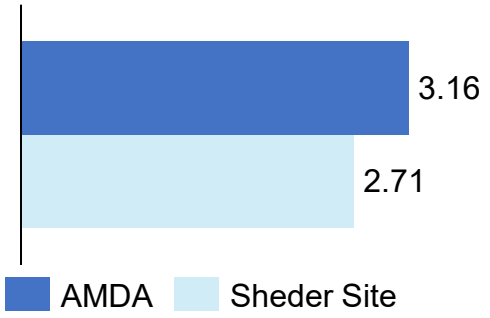
Key Takeaways

- ACPU at minigrid sites across sub-Saharan Africa is typically driven by business customers – this is most pronounced in Western and Central Africa
- The data indicates that business consumers at the Sheder site consume significantly more electricity on average than household consumers (200% more)
- Business consumers at the Sheder site also utilize a greater proportion electricity on average than their counterparts in East and Southern Africa
- The presence of the PUE Hub businesses also provides significant benefits to the Sheder site due to their relatively high energy demand

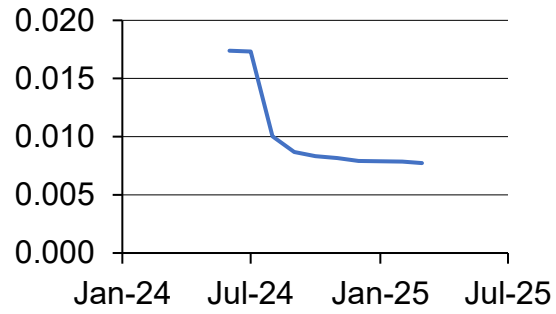
1. AMDA average includes data from Nigeria, Kenya, Uganda, Sierra Leone, Togo, Zambia, South Africa, Somalia, Benin, Mozambique, Madagascar and Cameroon

ARPU at the site is below that for the average minigrid site in Sub-Saharan Africa although comparable to Eastern and Southern Africa

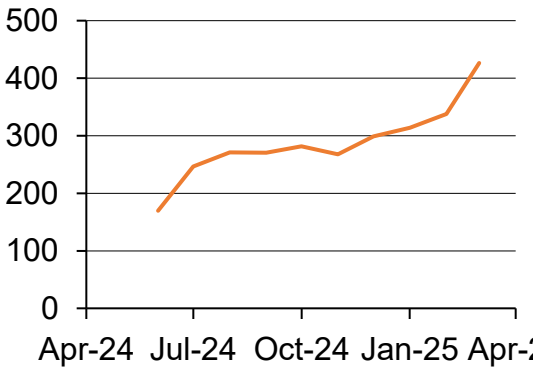
Average Revenue Per User, ARPU[1] ($/month)



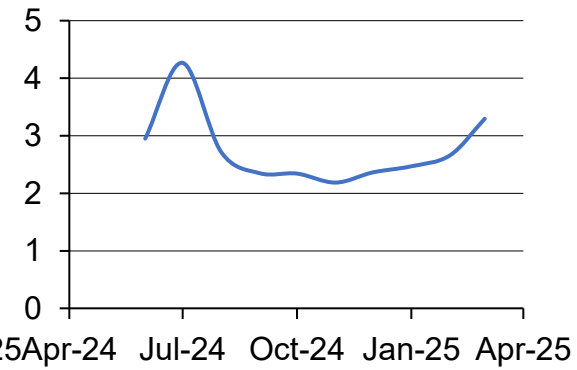
USD/ETB ($)



ARPU (ETB/month)



ARPU ($/month)



Description of data & source

Measure of average revenue per user (ARPU).

Based on the management's records of connection fees and electricity sales

Key Takeaways

- ARPU for the Sheder site is lower than that for minigrid sites across Sub-Saharan Africa despite comparatively higher ACPU – the lower ARPU is likely driven by lower tariffs in USD terms
- Ethiopia's decision to float its currency in July 2024 led to a significant decline in the value of the ETB against the USD
- Hence, the USD-denominated ARPU saw a decline in line with the currency depreciation between July and October 2024

1. ARPU is indicated is based on average ARPU between July 2024 and March 2025

Conclusion and recommendations

CrossBoundary Advisory

Findings suggest the site currently delivers electricity at an affordable price; however, a review is required to address currency depreciation

- Most customers (90%) indicate that they have **experienced a reduction in electricity payments** while a significant majority (~80%) also report that they are not financially burdened by their electricity payments – this suggests **current tariffs are affordable** to most customers

- However, there will be a need to re-assess affordability in the context of a significantly altered exchange rate environment. **Since July 2024, the ETB has declined by over 100 percent against the USD** resulting in a reduced tariff and revenue in USD terms

- Humanitarian Energy will therefore need to **review its current tariff to ensure it is sufficient to cover any USD denominated expenses** required for continued operations, including fixed expenses, debt repayments, maintenance, and any ongoing investments in system upgrades or improvements.

- Ultimately, there is a **need to balance the financial viability of the minigrid site with the social and economic implications for customers.** Increased tariffs are likely to affect affordability, resulting in more customers being 'burdened' by electricity costs. However, this review will be essential to ensuring the minigrid can continue to operate and serve the customers.

Approaches to optimize revenues

I) Implementing a universal tariff increase:

- The site currently utilizes a day and night tariff structure – Humanitarian Energy can apply an escalation on the tariffs for all customers but will need to implement this cautiously to prevent a significant drop-off in consumption, particularly from household customers who might be burdened by electricity payments.

II) Adopting a tiered tariff structure:

- **For Business customers:** given the high incidence of connected businesses, Humanitarian Energy may request that business consumers pay a higher tariff, to offset the impact on smaller, household customers (primarily refugees). The extent of the tariff increase should be measured to ensure electricity costs remains lower than diesel generators costs to avoid a decline in usage from this customer group

- **For non-refugee customers:** Humanitarian Energy can assess whether non-refugee customers can afford a higher tariff to offset any potential impact on increasing tariffs for refugee customers

Underlying indicators including high electricity demand, tariff acceptance and high ACPU/ARPU provide a basis for scaling and replication

- Assessing the site's true cost-effectiveness will **require further insight into overall expenses for the minigrid (i.e. including capital expenditure, financing costs etc.) and revenue streams** (including from subsidies, if any)
- Available data shows that the site is operationally viable. After accounting for the impact of currency depreciation on revenues, the **underlying indicators suggest this model could be scaled in Ethiopia and other markets if mitigating measures were put in place**
- Mercy Corps played a critical role in supporting demand activation through awareness raising campaigns and the financing of the PUE hub along with subsidies of 50% to electric appliances for the businesses it hosts - this Enter Energy partnership model between a commercial supplier and a non-profit organisation to support demand creation should be further explored and scaled up.
- Future sites seeking to serve refugee customers can **strategically locate sites around anchor productive use customers** to effectively help drive demand/revenue. This approach ensures the energy needs of vulnerable groups can be met while improving financial sustainability.
- There would also need to be a concerted effort by relevant stakeholders involved in the minigrid development to explore **hedging mechanisms to offset currency risks** such as the currency depreciation experienced in Ethiopia

Key Indicators

High Electricity demand: perhaps the most significant contributing factor to the site's performance is the presence of a large number of productive use consumers with high electricity demand – this drastically increases the viability of the site as it augments the relatively modest usage from refugee household customers

Tariff acceptance: most customers indicate reduced energy spend and limited financial burden suggesting they would be long-term users of the minigrid. Interviews with Humanitarian Energy also reveal that most customers would be comfortable with an increased tariff (i.e., after re-basing to match the revised USD exchange rate)

High ACPU/ARPU: The site's ARPU and ACPU are noticeably higher than sites in East and Southern Africa while being comparable to sites in West and Central Africa which historically have high consumption. This outcome is more pronounced when considering the customer profile of this site – the majority of consumers are refugees with generally have lower financial capacity than the average household customer.

Humanitarian Energy can seek to improve overall profitability of the site through optimizing its revenue and costs using four key levers

No. of customers

Despite underperforming target its target household customers; the site has reached saturation for household customers but an opportunity exists to **acquire more business customers** - data shows productive use consumers have significantly higher electricity demand than any other customer group and should be prioritized.

Tariffs

Review tariffs to align with revised USD/ETB – in view of >100% depreciation of the ETB against the USD, and increase in USD-denominated costs from a local currency perspective;

Humanitarian Energy should consider a review of tariffs to improve financial sustainability of the minigrid through:

- Implementing a universal tariff increase
- Adopting a tiered tariff structure

Consumption

i) Humanitarian Energy can explore approaches to **increase consumption from existing households** through appliance financing

Humanitarian Energy is currently conducting a clean cookstove pilot to increase consumption for this segment of users

ii) Identify opportunities to **support scaling of existing productive use consumers** (e.g. providing energy efficient appliances, providing linkages to microfinance/credit providers, enabling market access etc.)

Operating expense

OPEX review: given staff salaries form the greater share of OPEX, Humanitarian Energy should seek to find the optimal balance of staff at the site – e.g., by retaining only critical staff at the site and identifying opportunities to streamline corporate overheads attached to the site, where feasible. Additionally, Humanitarian Energy can explore opportunities to increase efficiency of individual site visits to reduce the number of required trips.

Revenue drivers Cost drivers

CrossBoundary Advisory

crossboundary.com/advisory

At the core of
CrossBoundary
is our purpose
We unlock capital for sustainable growth and strong returns in underserved markets

For more information please contact
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