November 2024

Learning from Developing Refugee Energy Markets in Uganda

A case study on refugee settlements in the West Nile Region

Photo credit: Malaika/GIZ

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Energy Solutions for Displacement Settings (SUN-ESDS) is a component of the Global Programme **Support to UNHCR in facilitating the operationalisation of the Global Compact on Refugees in the Humanitarian-Development-Peace Nexus (SUN)**, which is commissioned by the **German Federal Ministry for Economic Cooperation and Development (BMZ)** and implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

ESDS supports the Ministry of Energy and Mineral Development, the United Nations High Commissioner for Refugees (UNHCR) and the Office of the Prime Minister (OPM) in addressing the lack of a sustainable energy supply in refugee hosting areas through global advisory services and the implementation of technical measures in displacement settings in Uganda, Kenya and Ethiopia.

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Energising Development (EnDev) is a global multi-donor partnership that facilitates access to modern energy in about twenty countries worldwide. EnDev aims to reach more than 36 million people with access to needs-based, climate-friendly energy supply by 2025. The project is currently funded by four core donors (Germany, the Netherlands, Norway and Switzerland). A number of other government and charitable donors provide additional funding.

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Netherlands Enterprise Agency

Registered offices:
GIZ Uganda:
GIZ-Energy and Climate Programme
Pilkington Road
Kampala, Uganda
T +256 414104100
E info@giz.de

Bonn:
Friedrich-Ebert-Allee 32 + 36, 53113 Bonn
E info@giz.de
I www.giz.de/en

Contact:
Bettina Baesch Ssemwaka (Head of Component ESDS)
E bettina.baesch@giz.de

Published by:
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Author:
Peter Kakuru, Samuel Oyaku and Kisya Freisleben

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ABBREVIATIONS AND ACRONYMS

BMZ	German Federal Ministry of Economic Cooperation and Development
CRRF	Comprehensive Refugee Response Framework
EnDev	Energising Development
ESDS	Energy Solutions for Displacement Settings
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
HHs	Households
ICS	Improved Cookstoves
IVA	Independent Verification Agent
MEMD	Ministry of Energy and Mineral Development
NGO	Non-Governmental Organization
OPM	Office of the Prime Minister
PAY	Pay-as-you-go
PV	Photovoltaic
RBF	Results-Based Financing
RWC	Refugee Welfare Committees
SERP	Sustainable Energy Response Plan for Refugees and Host Communities
SHS	Solar Home System
SUN	Support to UNHCR in the implementation of the Global Compact on Refugees in the Humanitarian-Development-Peace Nexus
TA	Technical Assistance
UNHCR	United Nations High Commissioner for Refugees

INTRODUCTION

Energy is essential to all economic activities and to human well-being with energy services aiding in meeting basic human needs such as food production, provision of shelter and access to health services, as well as contributing to social development by enabling education. Notably, the lack of access to reliable and affordable modern energy is holding back economic and social development in many parts of the world today.

Despite the increasing wide-spread availability of low-cost off grid energy solutions[1] and the heavy investment into the electricity supply industry over the past two decades, Uganda's access to electricity stands at 57% of which 27% of households (HH) use solar kits for lighting, 11% use solar home systems, and 19% are grid connected[2] owing to the fact that electricity coverage remains at 82% in the urban setting and only 18% in the rural settings and worse within refugee gazetted locations.

GIZ Uganda supports the Government of Uganda to increase utilisation of the country's untapped renewable resources, meet its energy access and climate targets, and provide access to affordable, modern & reliable energy through the Energy and Climate Programme. The programme activities are carried out under different commissions and in close collaboration with the Ministry of Energy and Mineral Development (MEMD).

SUN-ESDS, EnDev and other development partners in collaboration with MEMD[3] have set out an ambitious vision to facilitate energy access within the humanitarian, development, and peace (HDP) nexus. This vision is guided by the Sustainable Energy Response Plan for Refugees and Host Communities (SERP). The plan enables the alignment and achievement of the objectives set out in Uganda's Comprehensive Refugee Response Framework (CRRF), National Development Plans and Uganda Vision 2040 with recognition that the energy sector is a major contributor to national development and government revenues, and its performance impacts the performance of other sectors (including refugee livelihoods).

1 https://www.gogla.org/from-ideas-to-action-using-end-user-subsidies-to-achieve-universal-energy-access
2 UBOS 2021. National Household Survey data.
3 Info on project and Partners

OVERVIEW OF MARKET DEVELOPMENT SUPPORT IN UGANDA

In Uganda, SUN-ESDS and EnDev, cooperate closely with MEMD, UNHCR, and the Office of the Prime Minister (OPM) to facilitate and improve framework conditions for sustainable energy access and provide access to modern energy services and products (solar photovoltaic (PV) systems and improved cookstoves) to refugees and host communities through market development. This support includes:

A.

Enabling increased access to energy through the implementation of two private sector led market-based approaches i.e., a results-based financing (RBF) scheme for both improved cookstoves (ICS) and solar PV systems in the West Nile region and Kiryandongo District, and **the energy kiosk model** within West Nile region only.

RBF Scheme

Working with improved cookstove and solar manufacturers and/or distributors, to close market distribution gaps for improved household (HH) energy solutions through targeted subsidies within project priority locations.

Energy Kiosk

Eight solar-powered energy kiosks were established in the refugee settlements of Rhino Camp, Imvepi, Bidibidi and Palorinya with the aim of improving access to quality energy products and services for HHs. Each kiosk is managed and operated by an Energy Kiosk Management Team including refugee and host community members. Each kiosk has been set-up with a standalone solar and storage system that is used for lighting and powering business devices for example a refrigerator for cold drinks, laptops, printer, and a phone charging booth. The systems have been designed with excess installed capacity for electricity to anticipate future electricity needs by an expanding business.

This paper focuses on the results and learnings gained through the RBF scheme.

B.

Enhancing service delivery with the provision of reliable and affordable clean renewable energy technologies for social institutions and small businesses. Case in point, **the solarisation of six health centres** which led to the installation of a business canteen at five health centres to sustainably cover future operation and maintenance costs borne by the solar PV system. Each canteen is managed by its respective Health Unit Management Committee.

RESULTS-BASED FINANCING

As a key implementation vehicle to increasing private sector participation in the development of energy poor markets, RBF is a mechanism that is structured to close off market gaps on either the supply side, demand side or both within the market while utilising the effectiveness of targeted financial rewards or incentives (also referred to as subsidies) pegged to pre-determined results. In this case, payments of claims to participating companies under the RBF scheme are made upon verification that results have been delivered. The rationale of the approach is to link financing more directly with outputs and outcomes, rather than inputs and processes. Since October 2020, EnDev and SUN-ESDS have been supporting ICS and solar companies to penetrate the market and sell off grid energy products and services in refugee hosting communities through an RBF scheme with additional support of market awareness. Furthermore, the participating companies were encouraged to establish effective sales/distribution partnerships with already existing GIZ supported energy kiosks in the Imvepi, Rhino Camp, Bidibidi and/or Palorinya Refugee Settlements. The RBF scheme targeting displacement settings had two competitive (public tender) application rounds.

FIRST ROUND RBF

The first round was structured with top-up incentives aimed at covering a portion of the incremental cost of doing business (especially logistical costs) while entering refugee markets. There were minimum requirements for companies to be able to participate, for instance related to the product's thermal efficiency, fuel saving ability, warranty, and quality certification. The call to bid was split up for companies selling off-grid solar energy products and those selling ICS. Table 1 on the following page shows how the RBF scheme, and its incentives were structured.

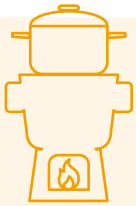
TABLE 1. RBF first round

<table>
<tr><th></th><th colspan="4">SOLAR</th><th colspan="4">IMPROVED COOKSTOVE</th></tr>
<tr><td>Aim</td><td colspan="4">to create additional access to quality solar products and to improved cooking energy products on top of the Partner's current sales in the defined geographical locations</td><td colspan="4"></td></tr>
<tr><td></td><td colspan="4">to facilitate the results-based, market-based, and verifiable distribution of up to 1,050 or 2,250 PicoPV and/or solar home system (SHS) per either two or three locations</td><td colspan="4">to facilitate the results-based, market-based, and verifiable distribution of up to 10,000 improved firewood and charcoal cookstoves for HHs</td></tr>
<tr><td>Eligible partners</td><td colspan="8">A producer/distributor of own product OR a distributor of third-party products, with the legal status of either a registered Ugandan company OR a Non-Governmental Organization (NGO) registered in Uganda, OR</td></tr>
<tr><td></td><td colspan="8">A consortium of such companies/NGOs with a consortium lead submitting the RBF proposal.
If a consortium will be awarded this tender, the consortium lead will become sole signatory to the partnership agreement
with the responsibility of reporting on project progress, monitoring, and financial accountability for the consortium members.</td></tr>
<tr><td>Location & product distribution</td><td colspan="4">1: Rhino Camp Refugee Settlement, Madi-Okollo and Terego Districts
2: Imvepi Refugee Settlement, Terego and Arua Districts and Arua City
3: Kiryandongo Refugee Settlement and Kiryandongo District

Required to sell in at least two locations and maximum three locations, i.e. 1,500 products in two locations or 2,250 products in three locations.</td><td colspan="4">1: Rhino Camp, Rigbo, Ogoko, Ulepi, Offaka, Okollo, Uriama, Anyiribu, Pawor Arua
2: Imvepi, Odupi, Omugo, Arua, Aivu, Bileafe, Katrini
3: Kiryandongo

An actor applies to implement their activities in at least two and maximum three regions and could opt to apply for one set of regions or two sets of regions, i.e. 1,500 products in two locations or 2,250 products in three locations.</td></tr>
<tr><td></td><td colspan="8">Note: The sales should be equally distributed between the regions the actor has applied for and between refugees and nationals.</td></tr>
<tr><td>Incentive</td><td>Product</td><td>Purpose of system</td><td>Max. remuneration per product (UGX)*</td><td></td><td>Product</td><td>Remuneration/ unit (UGX)*</td><td>Max. stove sales per Lot</td><td>Max. total remuneration per Lot**</td></tr>
<tr><td></td><td>PicoPV lanterns</td><td>Lighting, device charging</td><td>Up to 50,000 UGX</td><td></td><td>HH Charcoal stoves</td><td>18,000</td><td>2,500</td><td>UGX 50,000,000</td></tr>
<tr><td></td><td>SHS Tier 1 system (capacity < 50 Wp)</td><td>Lighting bulbs for rooms and security, device charging, FM radio</td><td>Up to 180,000 UGX</td><td></td><td>HH Firewood stoves</td><td>20,000</td><td></td><td></td></tr>
<tr><td></td><td>Tier 2 and above or cumulative system (capacity > 50Wp)</td><td>Lighting bulbs for rooms, and security purposes, device charging + other appliances</td><td>Up to 400,000 UGX</td><td colspan="4" rowspan="2">*Maximum value = Remuneration amount per stove type cannot exceed this
**Maximum total remuneration per Lot (cannot be exceeded)</td></tr>
<tr><td colspan="4">*Maximum value = Remuneration amount per product category cannot exceed this</td></tr>
</table>

The payment of incentives is made against **evidence** per product sold. Bulk sales to third parties for the purpose of free hand-outs to the end users is not considered as accountable for remuneration. These sales records are verified by an independent verifier. **Independent verification** includes review of documentation of the Partner as well as phone and field verification. Only accountable sales are used for the calculation of the total remuneration.



LESSONS LEARNED FROM FIRST ROUND RBF

On the supply side, it was initially hard to attract companies to participate, and once willing companies were found, it took 4-6 months to establish the supply chain closer to the targeted communities. It was especially difficult for some partners to geographically reach refugee communities. Furthermore, some partners did not have a conducive policy to sell to refugees, since customers needed a valid national ID rather than a refugee card for transactions. On the demand side affordability represented one of the major issues. However, in general, the roll out of this first round was also affected by covid restrictions. It became apparent through results shown below that selling to host communities was more convenient for companies.

Photo credit: Malaika/GIZ

SUPPLY

hard to attract private sector to participate (for both technologies)

companies had difficulties keeping records, which is key for sales verification

initially planned 8 months, but it took 4-6 month to establish markets, hence 16 months in total

DEMAND

affordability issue: refugee markets preferred cookstove tier 0

affordability issue: interest to buy solar technologies, but too expensive

challenges due to covid restrictions

generally easier to sell in host community markets

Results from sales made by the RBF participating companies under the first application round (figures 1 & 2) generally indicated a low market participation of refugees with 2.2% and 8.3% of the total sales for ICS and solar PV systems respectively.

There is a spike in sales for September 2021 (ICS) and October 2021 (solar), this could be due to companies resuming to move to markets after covid restrictions, in addition there were a series of marketing activities done by BM and ILF (radio talk shows, spot messages and DJ mentions). Note also, that spikes could have been attributed to harvest season where households have more income to spend.

Furthermore, in April 2022, participating RBF companies for both ICS and solar PV systems were supported in market awareness activities within Imvepi, Rhino Camp, Kiryandongo settlements, and their host communities.

FIGURE 1. First round ICS RBF performance

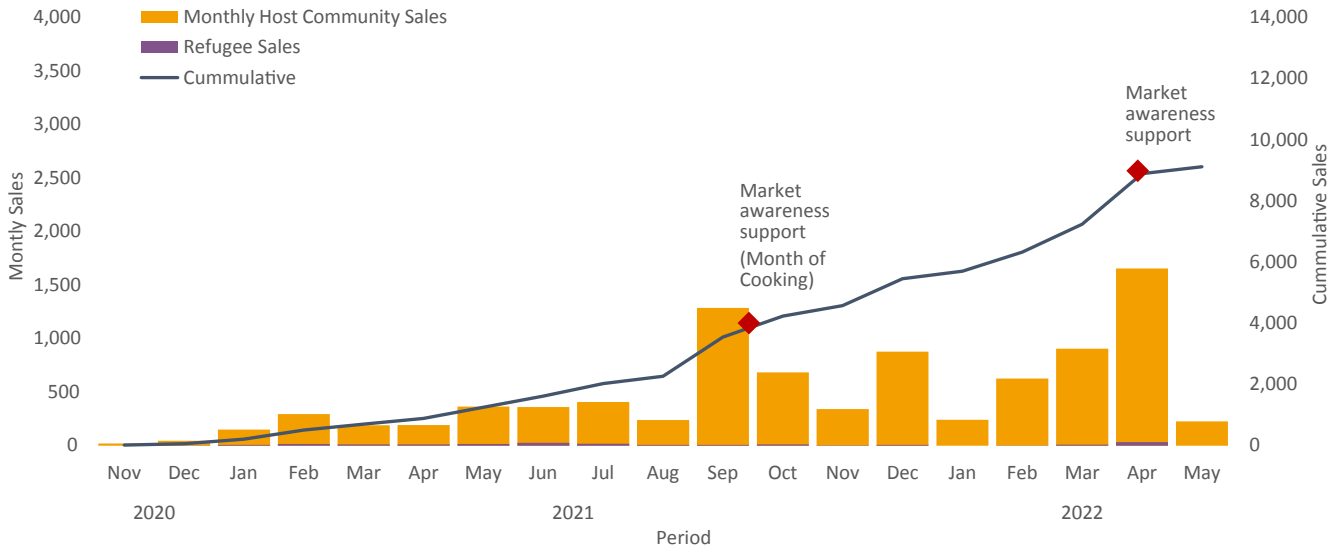
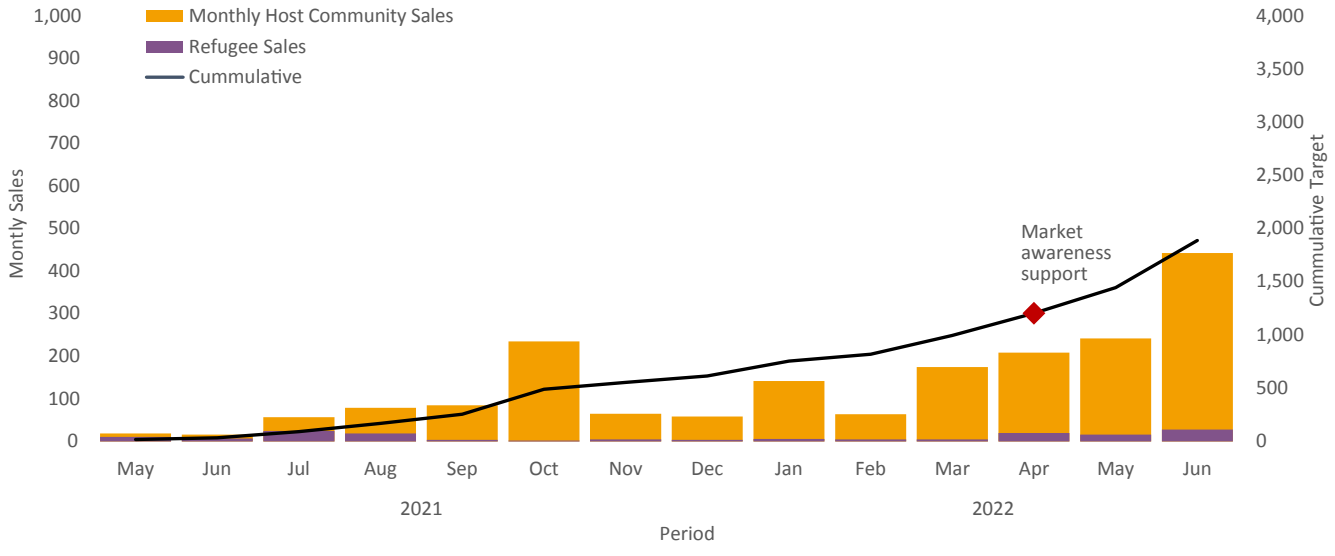
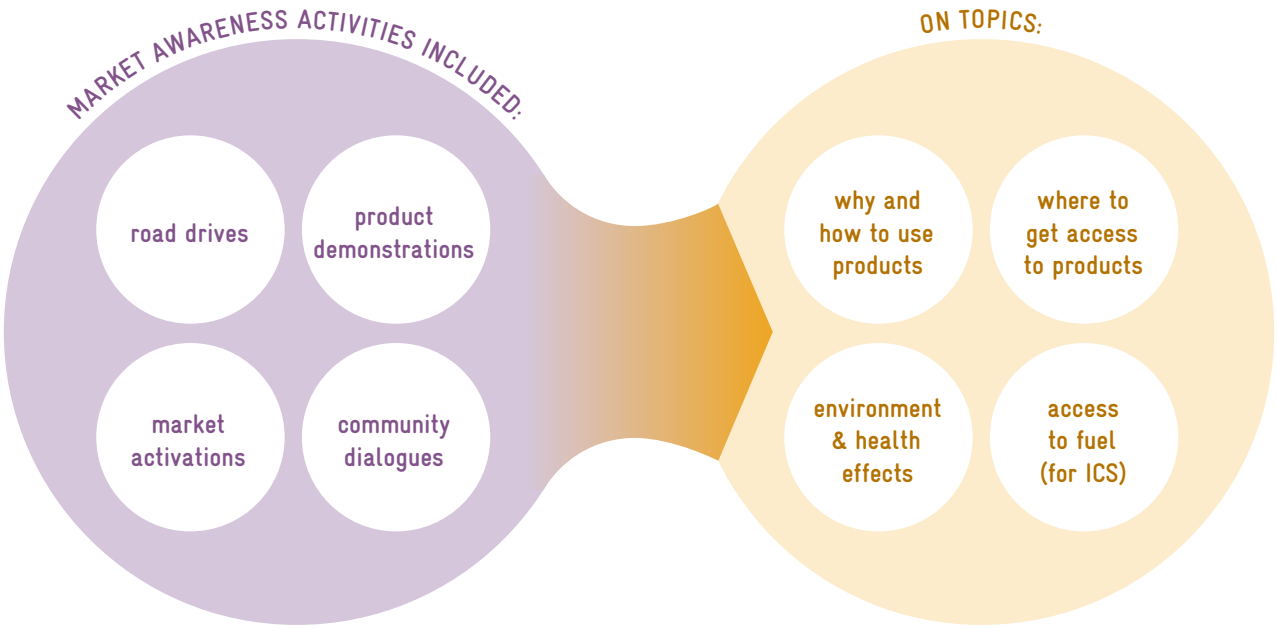


FIGURE 2. First round solar RBF performance



Lessons drawn from the support provided in market awareness point to increased knowledge transfer on the benefits of energy efficient technologies, end user information on product price, product use, sales points and available after sales services. In turn, road drives organised with infotainment sessions improved mobilisation within key locations and enabled companies to benefit from increased sales.

FIGURE 3. Road drive market awareness activity in Kiryandongo Refugee Settlement



Market limitations on both the demand and supply side significantly contribute to the low performance of sales made by both cookstove and solar companies against their projected targets. Thus, there is low energy access within refugee market segments. Being a refugee and host community focused investment, anecdotal evidence points to some of these limitations and project mitigation pathways as indicated here.

Limitation

1. Weak market linkages to close distribution gaps for many energy service companies with distribution hubs located within city centres which remain relatively distant from refugee markets. [supply]
2. Little or no investment from private sector companies dedicated towards market awareness activities to facilitate product/ brand visibility and product related information such as product use, warranty and repair services within refugee markets. [supply]
3. Limited internal capacities of RBF companies (especially cookstove companies) to collect sales data to enable the verification process. [supply]
4. Traceability limitations as some solar companies mostly require national IDs rather than refugee cards for a credit/ pay-as-you-go (PAYG) enabled sale. [supply]
5. Affordability issues, related to solar powered products, and ICS – preference steered toward lower tiers. [demand]
6. Lack of clarity on what type of products exist and where to access them. [demand]

Project level support

1. Customised the incentive structure within the second implementation round to build-in slightly higher top-up incentive amounts that incentivised private sector companies to sell even further into core refugee locations.
2. Generic market awareness support was given to companies to increase product visibility as well as increase local knowledge on use of energy efficient lighting and cooking technologies.
3. TA support was provided through training of sales agents on data required to conclude verification processes.
4. Advocacy to include refugee cards or attestation identification details within solar company processes. The local companies adjusted to this quickly or already had it in place, compared to the more international companies.
5. Market drives helped to understand different payment options offered by companies.
6. Market drives clearly raised awareness and led to increased sales.

SECOND ROUND RBF

Based on the lessons learned from the first round RBF, the second round was adapted to achieve more sales within the refugee community (higher incentives for sale to a refugee customer) and the geographical target area was increased. The call to bid was as the first split up for companies selling off-grid solar energy products and those selling ICS. The aim was generally set higher (up to 3,800 solar pico and home systems and 10,290 ICS). An end user subsidy was included to address the issues of refugee customers with an affordability gap.

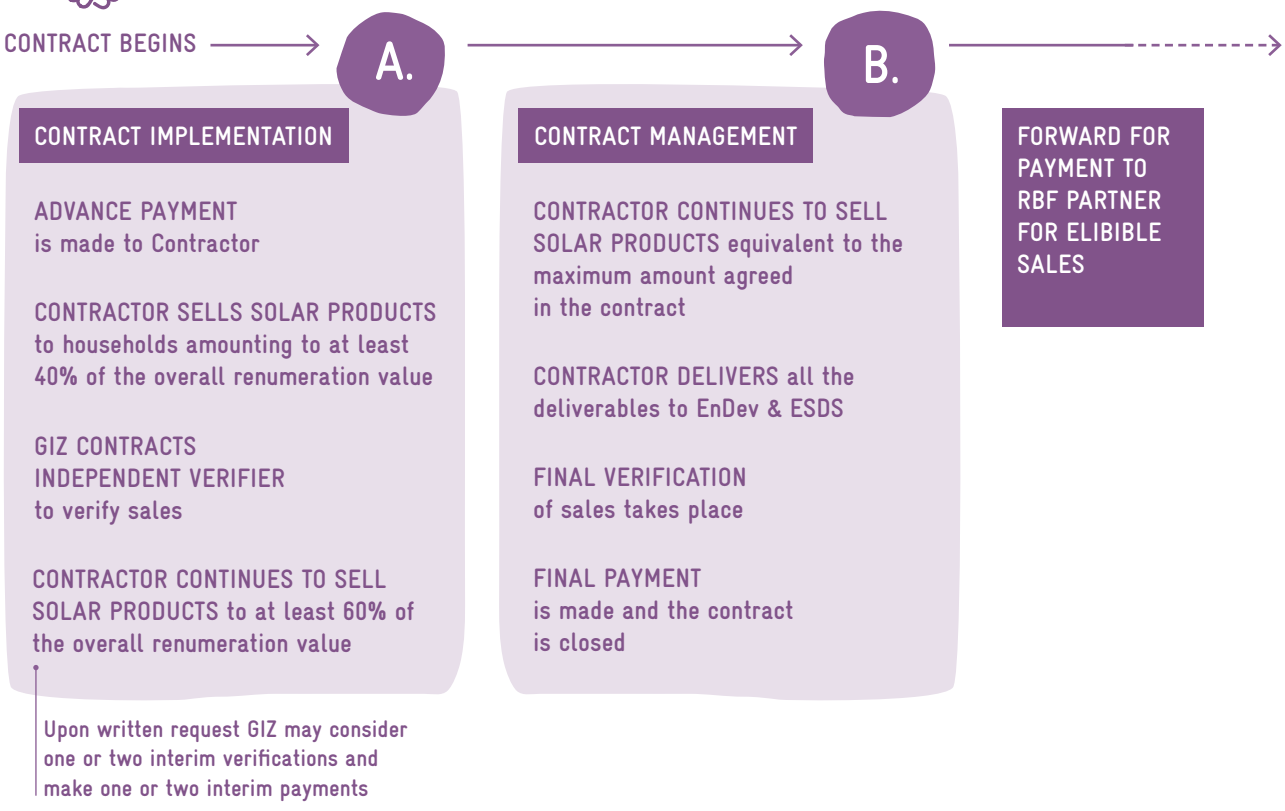
Furthermore, incentives based on gender aspects were integrated to reach more female headed households and increase involvement of women in the distribution chain. Companies that employ at least 30% or 40% female employees in direct distribution or management of the RBF **qualified for an additional 10% of the overall incentive earned**. Companies that achieved a minimum of 30% sales to female headed households **qualified for an additional 10% of the overall incentive earned**. For solar companies, one that trained its staff assigned to the execution of this contract in gender related topics qualified **for an additional 5% of the overall incentive earned**.

Through feedback provided and experiences made by participating companies, the second round also became more structured. If companies can easily comprehend the payment scheme, they are more likely to participate. Fig. 4 is an illustration of the renumeration process which was part of the second call to bid.

The payment of incentives is made against **evidence** per product sold. Bulk sales to third parties for the purpose of free hand-outs to the end users are not considered as accountable for remuneration. These sales records are verified by an independent verifier. **Independent verification** includes review of documentation of the Partner as well as phone and field verification. Only accountable sales are used for the calculation of the total remuneration.

NOTE
The verification is an assessment carried out by an Independent Verification Agent (IVA). It is a rigorous independent process that evaluates the correctness and quality of sales reported by each RBF partner contracted by GIZ, and subject to a given weighted remuneration for each sale deemed eligible under the project.

FIGURE 4. Remuneration process



LESSONS LEARNED FROM THE SECOND ROUND RBF

With consideration of the learnings drawn from the participating RBF companies under the first RBF application round, the incentive structure was re-designed and customised to cover the additional costs of transporting targeted technologies further away from city hubs or centres. Therefore, slightly higher supply side or top-up performance incentives were built into the RBF scheme to enable private sector companies to:

1. reach further into the refugee settlements by incentivising sales that occurred further away from Arua City with higher amounts.
2. geographically expand their market into other refugee settlements that had not been targeted by the earlier RBF round (i.e., Bidibidi, Lobule, Palorinya Refugee Settlements).

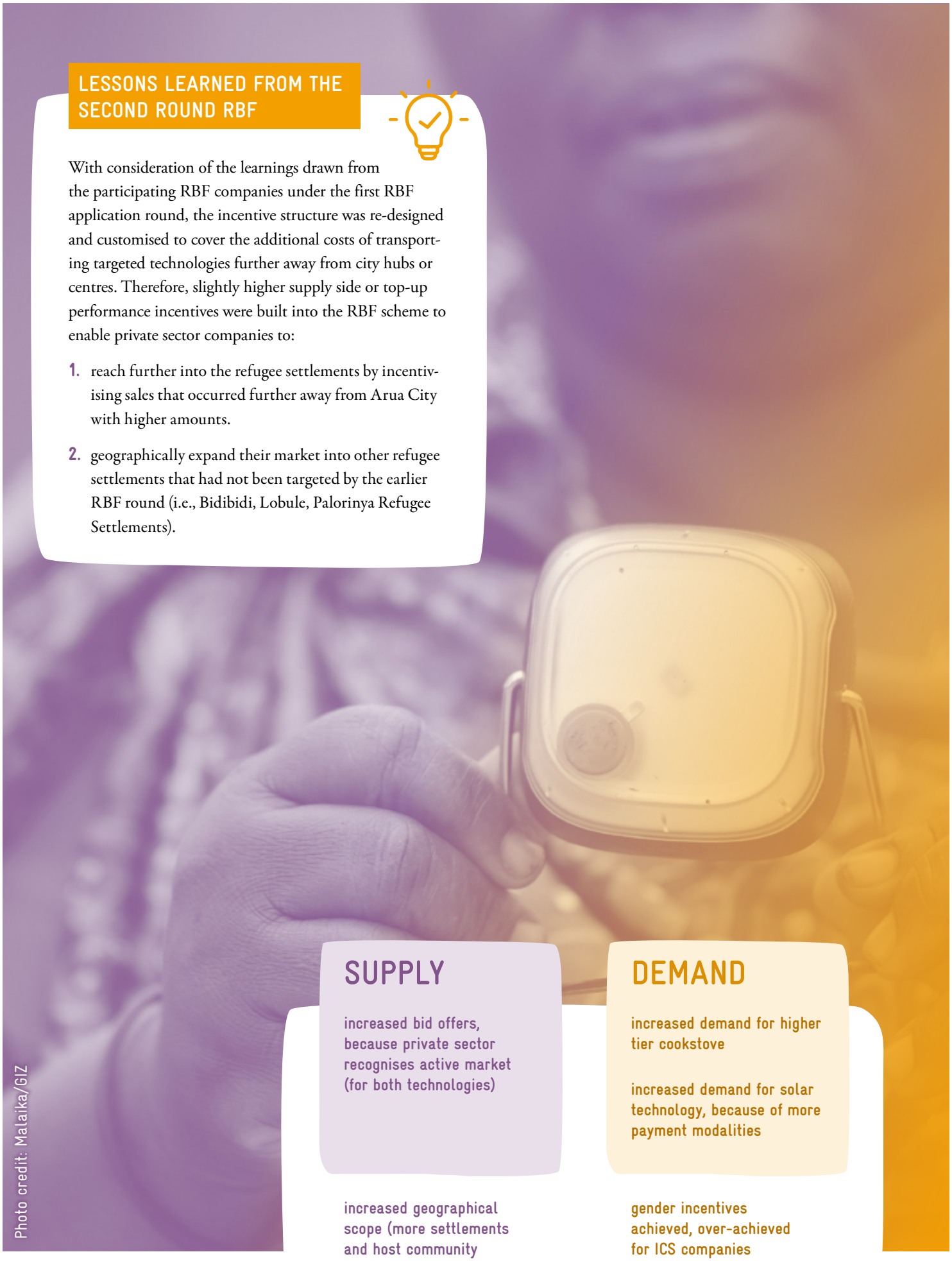


Photo credit: Malaika/GIZ

SUPPLY

increased bid offers, because private sector recognises active market (for both technologies)

increased geographical scope (more settlements and host community areas)

DEMAND

increased demand for higher tier cookstove

increased demand for solar technology, because of more payment modalities

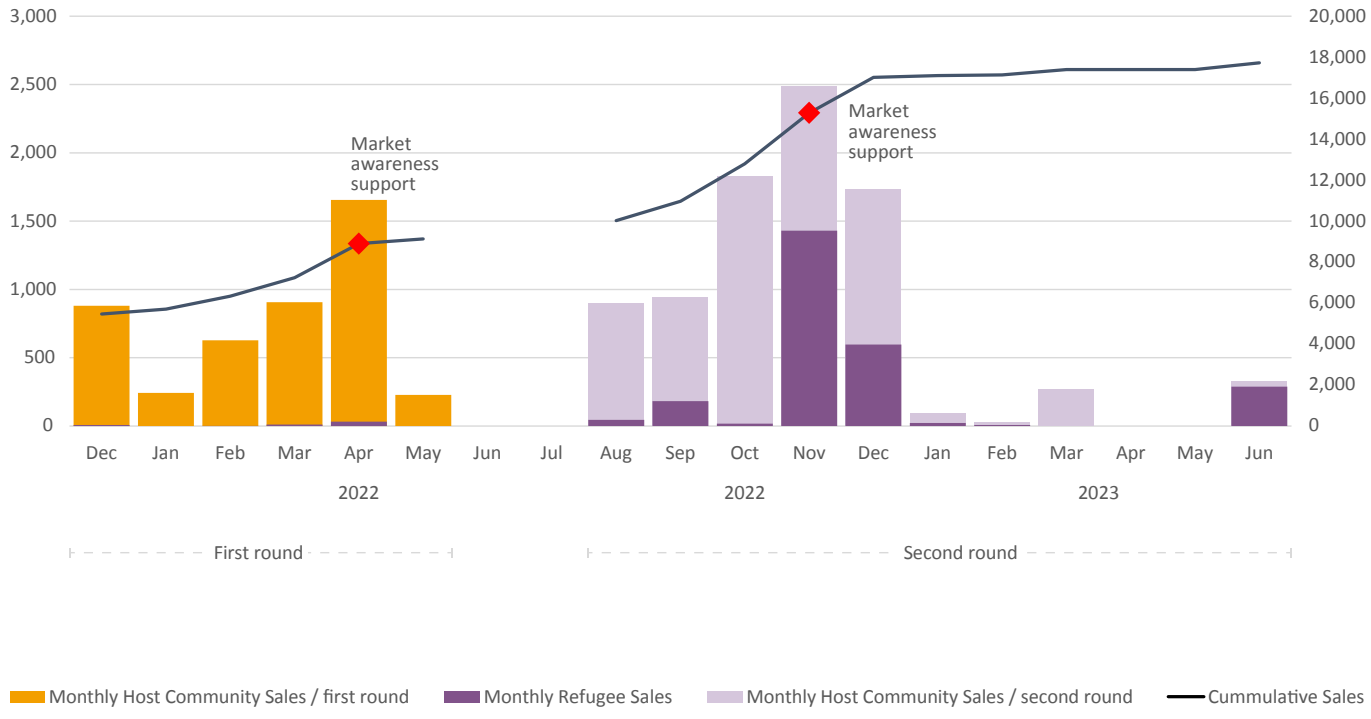
gender incentives achieved, over-achieved for ICS companies

In addition to the top-up incentive, an end-user subsidy structure was included into the RBF scheme as a pilot for the first four months with the intention of addressing the affordability gap existent within targeted refugee communities and to draw lessons from it. The end-user subsidy was delivered through participating companies, and it enabled a mandatory price reduction (communicated as a discount offer) on average 25% price reduction for cooking and solar technologies.

Product Category	Av. End-user Subsidy level
Tier 1 - 2 Improved cookstoves (charcoal and wood)	24%
Tier 1 Lantern + phone charging	20%
Tier 1 Solar Home Systems	32%

Results from the second RBF round (see figures 4 & 5), indicate an accelerated market access for clean energy with slightly more targets reached in a shorter period and increased refugee participation in the market with 30.1% and 37.7% of total sales for cooking and solar technologies respectively. Similarly, a longer targeted market awareness support package (running for two months) alongside an end-user subsidy in the refugee communities significantly increased product visibility and end-user knowledge about the product discount. This further influenced refugee consumer willingness to pay for quality energy products.

FIGURE 5. Comparison of ICS RBF the first and second round



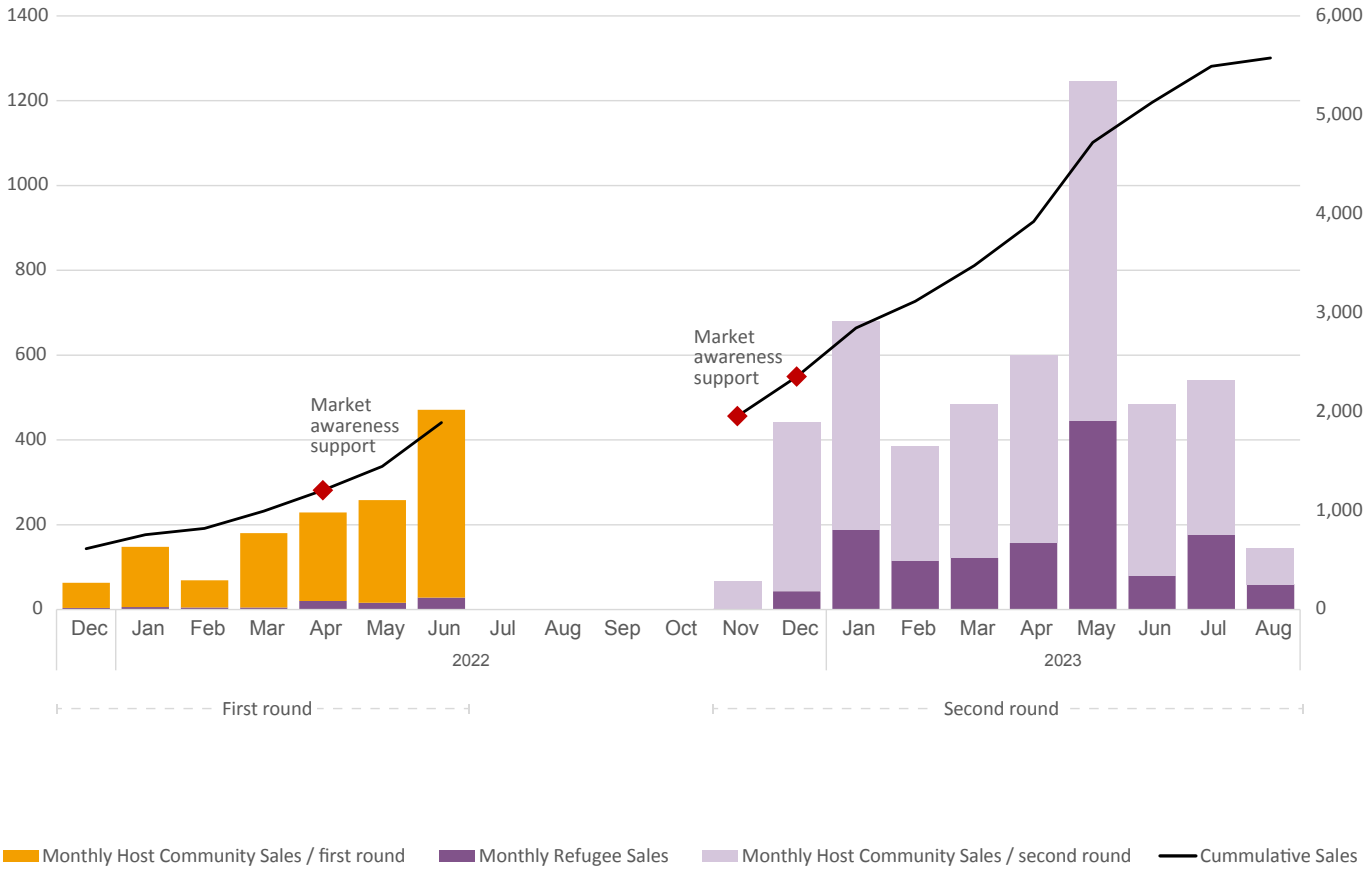
The partners reached their contractional target to refugees and sold above their target within the host communities in the second round. Furthermore, all companies have reached their gender targets, with ICS companies easily exceeding set targets to sell to female headed HHs.

In addition, given the layout of shelter for a single refugee household (i.e., separate structures for the parents, female youth, male youth, and any other relatives), it was noted that product design greatly influences the willingness to purchase a solar lighting technology. Demand for solar home systems (SHS) in this case is mostly drawn towards products with longer wiring. An alternative common practice of many households is to add additional wiring and lights to pre-designed systems unaware of system design integrity and automatic ineligibility of product warranty.

Other lessons learned include:

1. The subsidy should not be biased as the design of similar subsidy structure must remain the same in similar markets to avoid social cohesion issues between refugee and host communities.
2. The affordability gap within certain demographics (e.g., the very poor population) remains very large for a lower subsidy amount to achieve the required energy access.

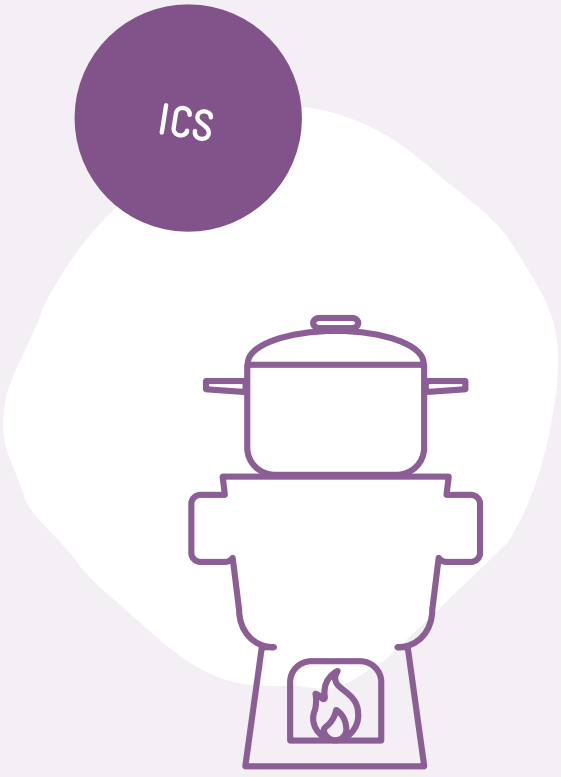
FIGURE 6. Comparison of solar RBF between the first and second round



RECOMMENDATIONS BASED ON VERIFICATION REPORTS OF SECOND ROUND RBF

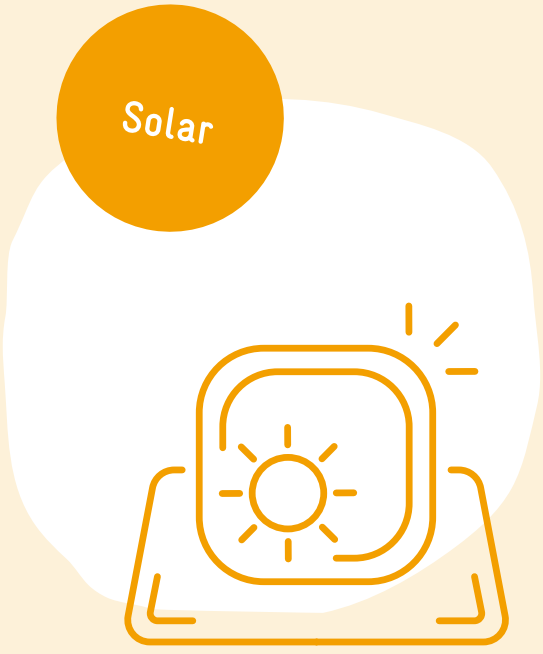
ICS

- **Adoption of Improved Charcoal Cookstoves:** Improved charcoal cookstoves are the clear favourite, with 89% of users choosing them, reflecting successful market penetration by participating companies. By maintaining their focus on sales strategies and highlighting the benefits, both companies can continue promoting clean cooking solutions.
- **Warranty Awareness Gap:** While participating companies provide a 1-year warranty, a significant number of customers (44%) are unaware or unsure of it. To bridge this gap, companies should improve communication by offering verbal explanations, training sales representatives on warranty details, and following up with customers to ensure understanding.
- **Maintenance and Usage Education:** Over half of users lacked guidance on proper maintenance, posing a risk to long-term performance. To address this, companies should offer continuous educational support via instructional materials and hands-on demonstrations to reinforce best practices.
- **Training on Cookstove Use:** Although both participating companies provide end-user training, only 34% of customers reported receiving it. To address this, companies should standardise training, track the process for each customer, and gather feedback to improve training. Providing user-friendly instructional materials will further assist those relying on self-learning.
- **Customer Satisfaction and Product Quality:** High customer ratings indicate that the cookstoves are well-designed and durable. To sustain this, companies should continue product development, focus on quality control, and gather customer feedback to improve further.
- **High Recommendation Rates:** The strong recommendation rates reflect customer satisfaction with companies' products. To leverage this, companies should introduce referral programmes, encourage testimonials, and use this positive feedback in marketing. Continuous customer feedback will help maintain high satisfaction levels.



Solar

- **Enhancing Solar Product Financing for Refugees and Customers without IDs:** While 97% of end-users could register for cash or PAYG plans, 3% faced challenges due to a lack of national IDs, particularly among refugees. Solar companies should collaborate with local authorities and refugee welfare committees (RWCs) to establish alternative ID methods like attestation cards or other refugee registration documents. Sales agents and support staff should be trained on these alternatives, and partnerships with RWCs can provide secure ways for refugees to access SHS financing.
- **Addressing Solar Product Price Perception:** With 59% of end-users viewing SHS prices as too high, companies should focus on offering flexible payment plans, subsidies, or cost-efficient designs. Highlighting long-term benefits will also help justify the investment for customers who already find the prices affordable.
- **Leveraging Door-to-Door Sales:** Door-to-door sales account for 75% of total sales across all RBF companies, showing its effectiveness. Companies should prioritise training sales agents to engage customers effectively, addressing concerns and building trust. Additionally, retail locations and awareness drives can enhance brand visibility and expand reach.
- **Improving SHS Training Programmes:** While 78% of users are satisfied with SHS training, 22% report dissatisfaction. Companies should review and redesign training programmes based on customer feedback. Incorporating hands-on elements like demonstrations will help cater to diverse learning preferences and ensure all customers feel supported.
- **Enhancing Product Quality and Reliability:** Though 29.5% of customers appreciate SHS durability, 19.6% report charging system issues. Companies must prioritise product quality, focusing on critical components like batteries and lighting. A robust customer feedback system will help identify and address product performance concerns.
- **Strengthening After-Sales Support:** With 61.5% of complaints unresolved, companies need to improve after-sales support. Training staff in troubleshooting, product knowledge, and communication will enhance the customer experience. Establishing accessible support channels, such as helplines or service centres, will further strengthen customer satisfaction.



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Registered offices:
Bonn

Friedrich-Ebert-Allee 32 + 36
53113 Bonn

E info@giz.de
I www.giz.de/en

On behalf of

Federal Ministry
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