



# BRILHO

**Transforming  
off-grid energy  
access in Mozambique:  
the BRILHO programme  
contribution (2019-2024)**



*“It is inspirational to see in the field and in this practical report how much progress has been achieved in the last few years under the off-grid energy market. The BRILHO programme has been central in the transformational process for this ecosystem, which today has become a key contributor to our national energy access in alignment with the energy transition strategy. BRILHO is highlighted due to its localized approach, adaptability, efficiency, and scale. As reflected in this report, it is important to not only maintain the remarkable progress made but address the challenges relevant to this new market development stage and continue to scale towards the universal access to energy goal.”*



**Dr António Osvaldo Saíde**

Vice - Minister  
Mineral Resources and Energy (MIREME), Mozambique

This report is a product of BRILHO-SNV. The Catalyst Energy Advisors team of Xan Garcia Ehrhardt, Rachel McManus, Dan Murphy, and Ian Muir drafted the core content and carried out the original analysis. Pedro Moleirinho, Javier Ayala, Salomão Cuambe, and Jose Romão of BRILHO-SNV provided direction and content. The BRILHO-MDF companies provided additional contributions.

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MINISTÉRIO DOS RECURSOS  
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## Acronyms and abbreviations



<b>ARENE</b>	Autoridade Reguladora de Energia (Energy Regulation Authority)
<b>CEO</b>	Chief Executive Officer
<b>CG</b>	Catalytic grant
<b>EU</b>	European Union
<b>ETS</b>	Energy Transition Strategy
<b>FASER</b>	Fund for Sustainable Access to Renewable Energy
<b>FTE</b>	Full time equivalent
<b>FUNAE</b>	Fundo do Energia, The Energy Fund
<b>GBP</b>	British Pound
<b>GDP</b>	Gross Domestic Product
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit, German development agency
<b>GoM</b>	Government of Mozambique
<b>HH</b>	Household
<b>HS</b>	Harmonised System (of WTO codes)
<b>ICS</b>	Improved Cooking Solution
<b>kWh</b>	Kilowatt-hour

<b>MDF</b>	BRILHO Market Development Fund
<b>MFI</b>	Micro Finance Institution
<b>MG</b>	Mini-grid
<b>MIREME</b>	Ministry of Mineral Resources and Energy
<b>MW</b>	Megawatt
<b>PAYGO</b>	Pay as you go
<b>RBF</b>	Results-Based Financing
<b>REDD+</b>	Reducing emissions from deforestation and forest degradation
<b>SADC</b>	Southern African Development Community
<b>SDG7</b>	Sustainable Development Goal 7
<b>SHS</b>	Solar Home System
<b>SSA</b>	Sub-Saharan Africa
<b>TA</b>	Technical assistance
<b>tCO<sub>2</sub>e</b>	Tons of carbon dioxide equivalent
<b>USD</b>	United States Dollar
<b>W</b>	Watt



# Introduction

**Mozambique faces significant challenges in achieving SDG7, though it has made significant strides in recent years.** Here's a glimpse of what the landscape looks like now.



- ✈ **Population:** 34 million in 2024 with a 2.5% growth rate.<sup>1</sup>
- ✈ **Capital city:** Maputo
- ✈ **GDP per capita:** USD 582/year (2022), the 43rd lowest in Sub-Saharan Africa.<sup>2</sup>
- ✈ **Over 16 million**<sup>3</sup> people without access to electricity who spend on average **USD 13 per month**<sup>4</sup> on stop-gap solutions.
- ✈ **Over 31 million** people are without access to clean cooking<sup>5</sup>, and 95% of people use charcoal or wood for cooking<sup>6</sup>, less than 20% of whom use improved cookstoves<sup>7</sup>.

Photo credit: BRILHO/SNV

1, 2. <https://ine.gov.mz/web/quest>  
3. GoM, Energy Transition Strategy  
4. [https://www.lightingglobal.org/wp-content/uploads/2019/06/mozambique\\_off-grid\\_assessment.pdf](https://www.lightingglobal.org/wp-content/uploads/2019/06/mozambique_off-grid_assessment.pdf)  
5. <https://trackingsd7.esmap.org/country/mozambique>  
6. <https://www.lerenovaveis.org/contents/lerpublicacion/resumo-renmoz2023.pdf>  
7. GoM, Energy Transition Strategy

## BRILHO was designed to overcome key market barriers to accelerate the transition to sustainable energy access.



Since 2019, **BRILHO set out to catalyse Mozambique's off-grid energy market** to provide clean and affordable energy solutions to the country's off-grid population. BRILHO's overall goal is to **improve and increase energy access for people and businesses**, leading to money-saving, better well-being and livelihood opportunities for the low-income population. Its holistic approach tackles three key market dimensions: **supply, demand, and enabling environment**. This is achieved through:

### Market Development Fund:

The MDF aims to help de-risk businesses to achieve commercial returns while providing off-grid energy solutions to low-income markets. MDF instruments include:

- **Results-Based Financing** to accelerate the market and reach the most vulnerable.
- **Catalytic Grants** provide short-term support for cash-flow-intense activities and build the foundations of the business, such as setting up operations, expanding into new regions, investing in assets, and purchasing stock.
- **Technical Assistance** to strengthen business performance in the long term.

### Research and Dissemination:

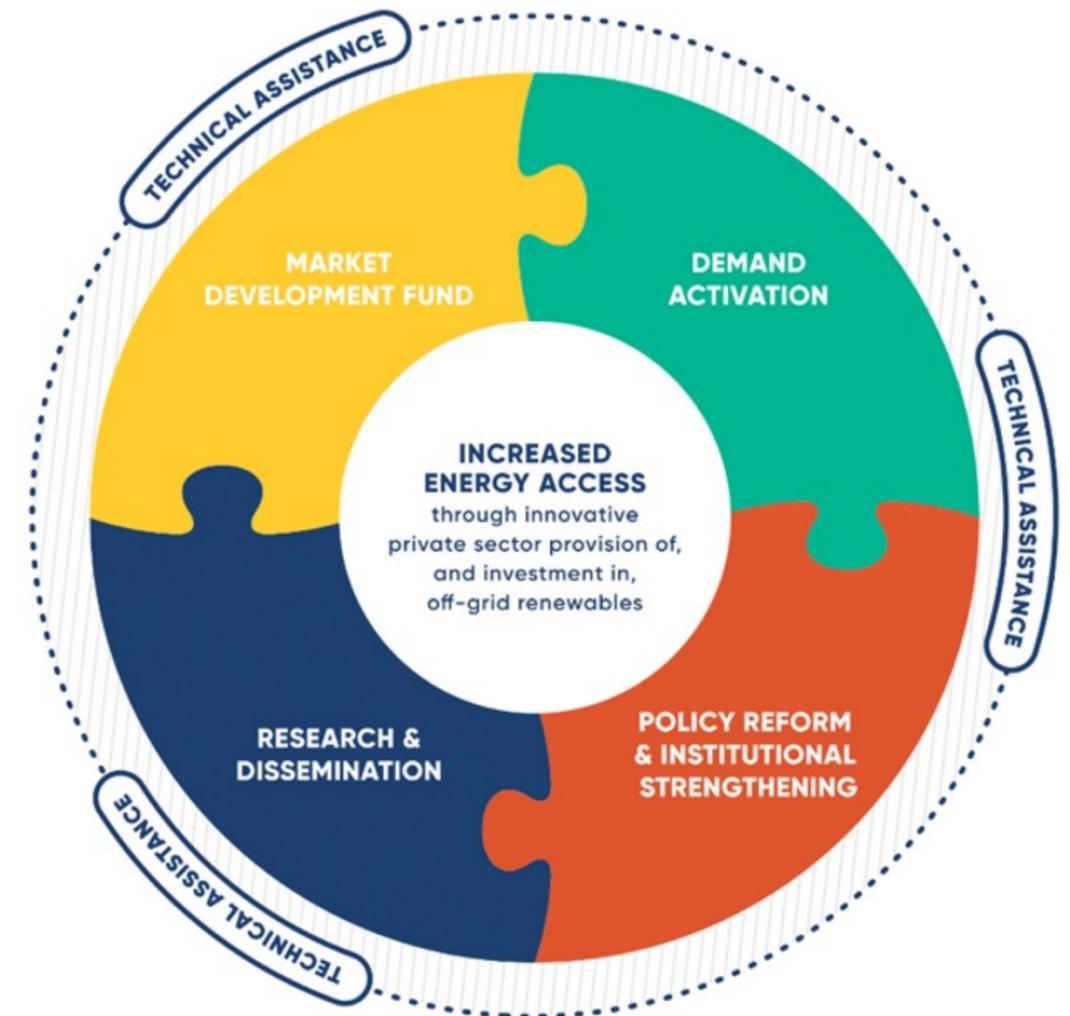
Deliver strategic data and insights to inform public and private decision-makers.

### Policy Reform and Institutional Strengthening:

Development and strengthening of an off-grid energy policy framework that enables investments and a sustainable market.

### Demand activation:

Provide awareness-raising among off-grid Mozambicans on options and the benefits of modern renewable energy solutions.



BRILHO worked to transform the market through these specific interventions:



**Market Development Fund**

**Supported 24 companies** in 3 sub-sectors: solar home systems, improved cooking solutions and green mini-grids.

As of the end of 2024, disbursed **GBP 18 million in catalytic grants and results-based financing.**

**Demand activation**

Conducted both above and below-the-line **campaigns on behavioural change and consumer awareness** to unlock demand for modern, reliable energy access products in rural areas; implemented in close collaboration with MDF investees, GoM partners, Escola do Agricultor, Panavideo and Janete-Anima. Broadcast in **4 languages across 30 communication channels**, reaching over **1 million people.**

**Policy reform & institutional strengthening**

Supported GoM to develop and operationalise the first **off-grid energy regulatory framework** while strengthening the capacities of relevant public institutions such as the Ministry of Mineral Resources and Energy (**MIREME**), the Energy Regulatory Authority (**ARENE**), and the Energy Fund (**FUNAE**).

**Research & dissemination**

Hosted the first **Regional Conference on the Regulatory Framework for Access to Off-grid Energy** in 2022. Published a [Productive use of Energy](#) Market Research report. Worked with 60 Decibels to deliver two [Lean Data Insights Reports](#). Also carried out market assessments, [province profiles](#), and [micro-economic impact studies](#).

**Technical assistance**

Supported **14 companies** with Technical Assistance on market entry, business-to-business matchmaking, legal advice, Gender Equality and Social Inclusion (GESI), Safeguarding, Women’s Empowerment, PAYGo credit management and matchmaking with debt/equity investment opportunities.

# BRILHO has supported 24 companies across 3 technologies



Solar Home Systems



Green Mini-Grids



Improved Cooking Solutions

Grey boxes indicate previous MDF companies that are no longer supported by BRILHO. These companies either did not start operations as expected (e.g., due to the Covid-19 pandemic), did not perform as expected, closed operations, or fulfilled contractual agreements

**BRILHO's impact through the end of 2024 was substantial** thanks to its holistic intervention in the off-grid energy market in Mozambique.



**£ 41.8 M**  
in direct and co-invested funding to support



**24**  
companies leading to



**627,000+**  
products sold



**2,401**  
jobs created (FTEs), 37% female



**1,876,355**  
# of people with access to electricity



**1,265,115**  
# of people with access to improved cooking



**790,170 tCO2e**  
greenhouse gas emissions avoided

**From the customers themselves:** highlights from two lean data studies assessing the life-changing impact that the BRILHO-supported initiatives are delivering.



**97% of energy beneficiaries say the quality of their lives has improved since using the new product.**

Metric	SNV BRILHO Round 1: Mar 2023	SNV BRILHO Round 2: Nov 2023		60dB Energy Benchmark
<b>First Access</b> % accessing product for the first time	85%	91%	>	80%
<b>Access to Alternatives</b> % with no easy access to good alternatives	70%	71%	<	77%
<b>Quality of Life</b> % 'very much improved' quality of life	56%	73%	>	53%
<b>Customer Satisfaction (Net Promoter Score®)</b> on a scale from -100 to 100	71	72	>	49
<b>Ease of Use</b> % not experiencing challenges	87%	85%	>	69%
<b>Customer Service (Customer Effort Score)</b> on a scale from 1 to 5	3.00	2.50	<	3.23

**"My life has changed as I used to take an average of 3-4 hours to prepare meals, but with the stove, that time reduced to an average of 1 hour and 30 minutes, saving me money and time."**

**60 \_ decibels**

**SNV**  
**BRILHO Programme**

Lean Data Insights  
Aggregate Report

Mozambique

60 \_ decibels
March 2023



# Part 1

# Market Transformation

from BRILHO's Inception to the end of 2024



# Solar Home Systems



Between 2020 and 2024 BRILHO catalysed Mozambique's SHS market, in terms of both sales volume and geographic expansion.



BRILHO promoted expansion into the **most challenging** and **underserved provinces** in Mozambique.

#### Where they focused:

- BRILHO accelerated expansion from the south, where Maputo is, to the centre and north, which have lower electrification rates and lower ability to pay.

#### What BRILHO offered via the Market Development Fund:

- The RBF was designed with a base-level incentive and 3 top-ups based on: energy service level, vulnerability access index and productive uses of electricity.
- Some companies received catalytic grants to expand into new regions and harder-to-reach areas such as Nampula, Niassa and Tete.

#### Why it worked:

- The bonuses incentivised companies to move into harder-to-reach regions.
- Catalytic grants solved cash flow issues for companies, who could then invest in stock, expansion and other strategic activities.

#### Remaining challenges:

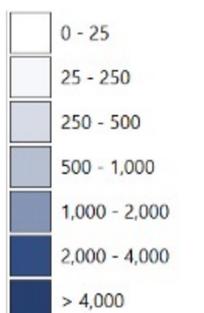
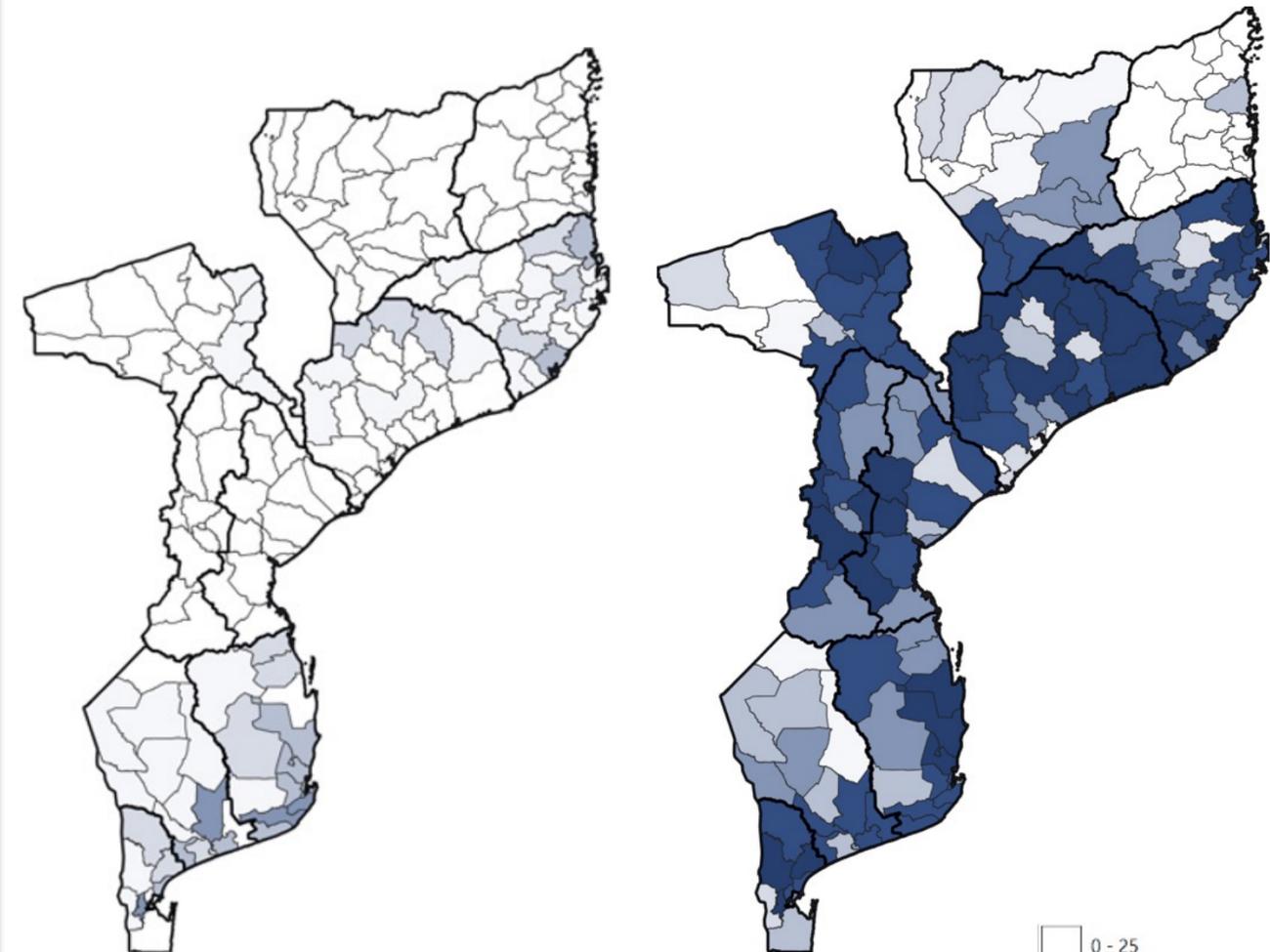
- Geographic expansion:
  - **Cabo Delgado** remains a difficult province in which to operate due to an armed conflict that has been active in the region since 2017, displacing almost 1 million people.
  - **Niassa** is challenging to access due to poor road infrastructure and spillover impacts from the conflict in Cabo Delgado<sup>1</sup>.
- Deepening market penetration: despite the high level of geographic expansion, there is still a massive potential to further address demand in most districts.
- Slow adoption of PUE solutions due to high capex costs, limited technical know-how, unclear market potential, limited strategic partnerships, limited suppliers at scale and lack of end-user financing.

<sup>1</sup> Sida top-up funding will support further expansion into Niassa.

### Cumulative BRILHO-supported SHS sales

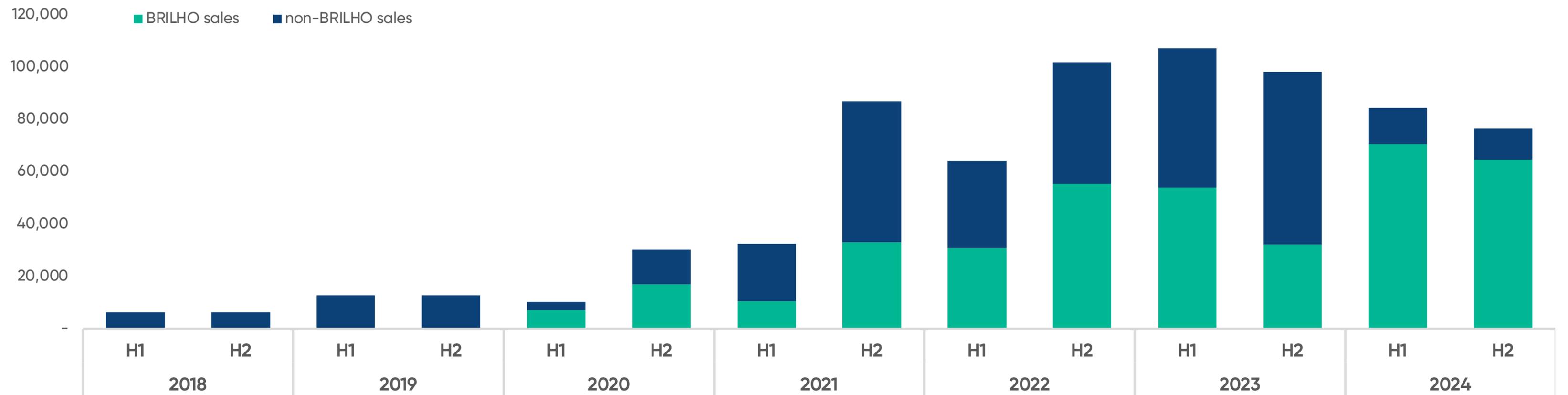
2020

2024



Units sold

BRILHO financing unlocked **over half of all quality-verified sales** in Mozambique between 2020 and the end of 2024.



Source: GOGLA half-year sales data; BRILHO company reports

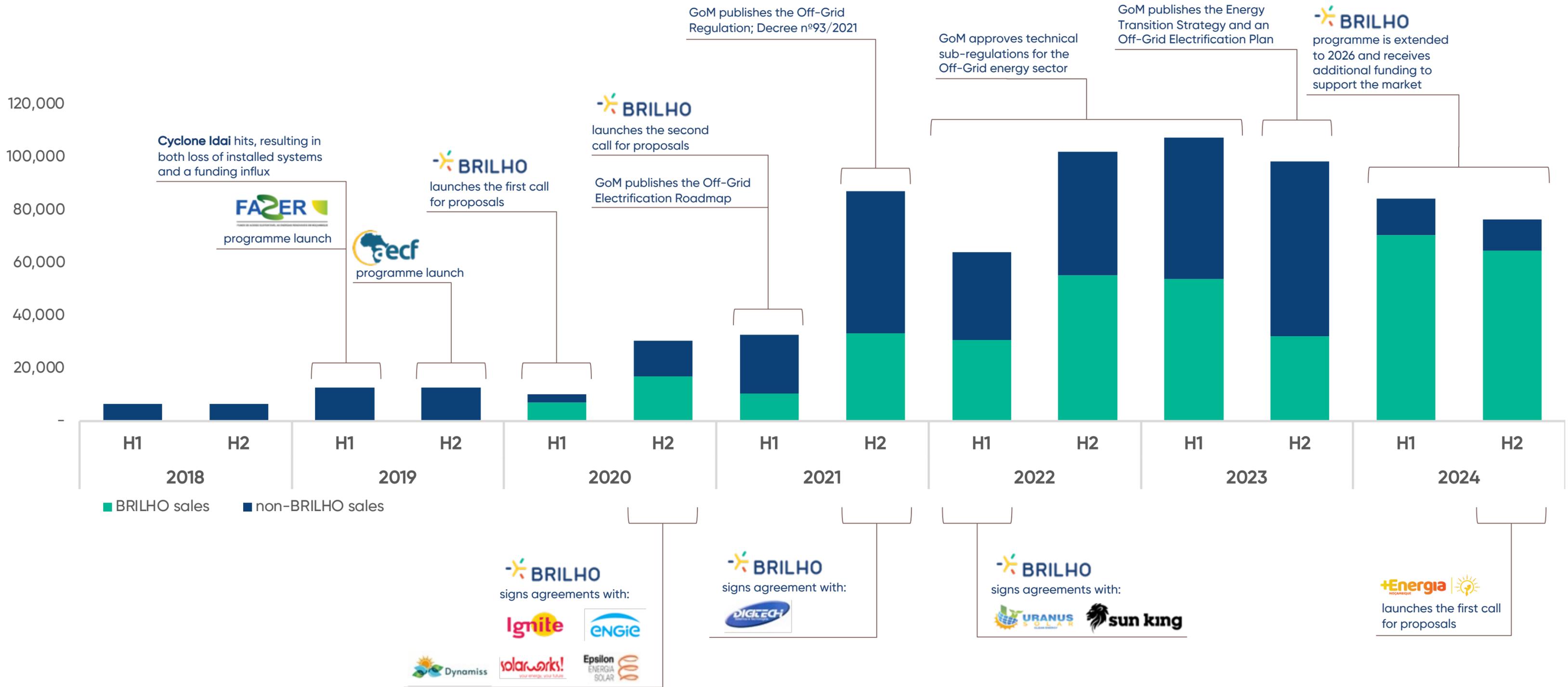
### Here's how this market evolution played out:

- **Before 2018:** SHS were mostly used in community installations with very little private sector involvement. Most systems were installed and owned by FUNAE. As of September 2017, FUNAE had provided energy to 790 schools, 690 health centres, 180 villages, 50 mini-grids, and 70 district and administrative post headquarters<sup>1</sup>.
- **2018-2019:** In the 2 years preceding the BRILHO programme, there were fewer than 40,000 cumulative quality-verified sales in the market.\*
- **2020-2024:** after BRILHO's market entry, annual sales jumped to an average of **140,000 quality-verified\*** units, reaching a maximum of 200,000 sales in 2023. The BRILHO programme provided **results-based financing to 375,000 of the 700,000 quality-verified sales made since 2020.**
- **From 2022 to 2024, BRILHO's sales accounted for an average of 54% of the new SHS installed nationally.**

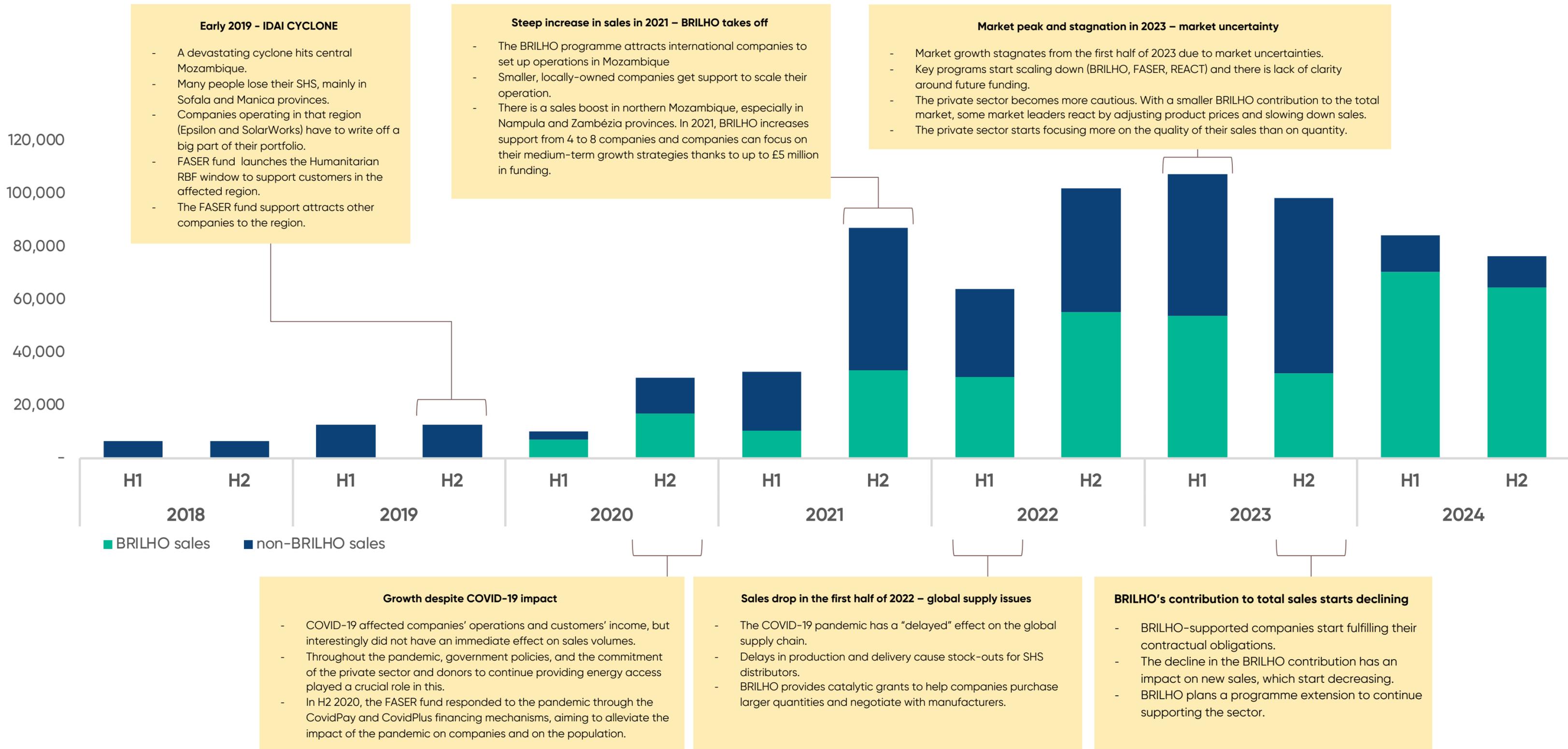
1. Renewable Energy Projects Portfolio (2017), FUNAE

\* This includes sales of products certified by Verasol and reported to GOGLA. The informal market is excluded.

# The SHS PAYGo market evolution since BRILHO inception shows rapid growth.



# Here's a closer look at the events that impacted SHS sales since BRILHO inception.





20,000 SHS products sold



32 FTE employees  
220 sales agents

£ 750,000 in BRILHO funding



**Founded in 2018**, Epsilon is improving the lives of Mozambicans by selling on a PAYGO basis: SHS, solar water pumps, smartphones and soon EVs. They have also diversified to selling productive use of energy equipment such as solar water pumps, cold storage, and solar [+ battery storage] solutions for small to medium commercial and industrial customers. They have raised a total of **USD 3.3 million in financing** to date.

Thoughts from Epsilon CEO, Paulo Raposeiro:



**What's Epsilon's strategic vision?** "We want to become the go-to PAYGo company in Mozambique, offering a wide range of products and services for households, farmers, and businesses"

**What would be the most impactful single action BRILHO and others could take over the next 2 years to support Mozambique's SHS market?** "Epsilon still needs RBF subsidies to offer SHS in off-grid areas. BRILHO and other development partners should ensure continuity of RBF programs, while working with the Government of Mozambique to create an enabling environment for SHS businesses, especially reducing VAT and import duty costs for solar companies."

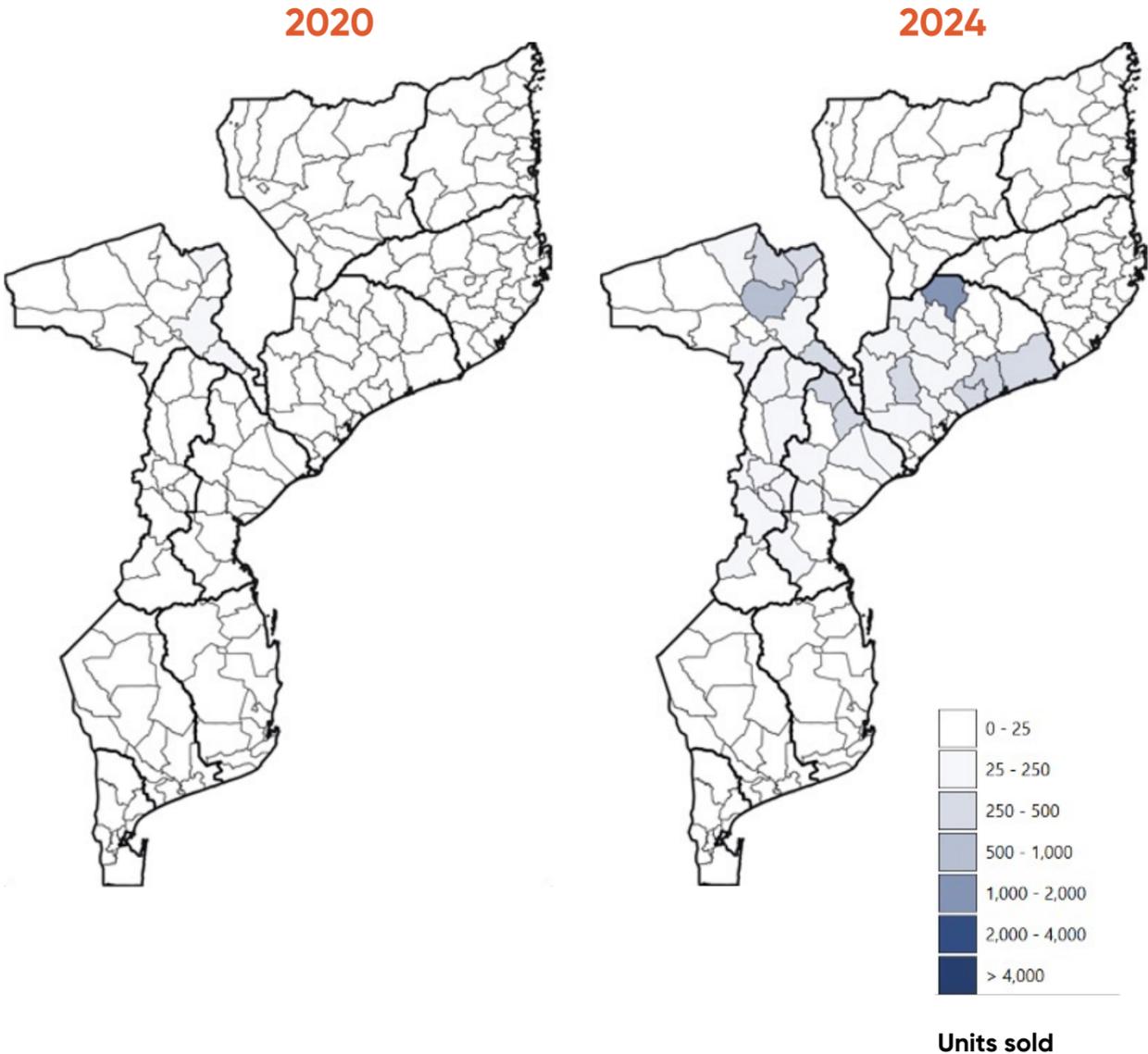
**BRILHO's support to Epsilon:**

**RBF:** RBF subsidies allowed the business to lower prices to match customers' ability to pay and allowed sales growth. Epsilon sold 8,000 units through the BRILHO RBF.

**CG:** Catalytic grants were crucial to expand to certain regions as they covered some of the capital expenses and expansion costs.

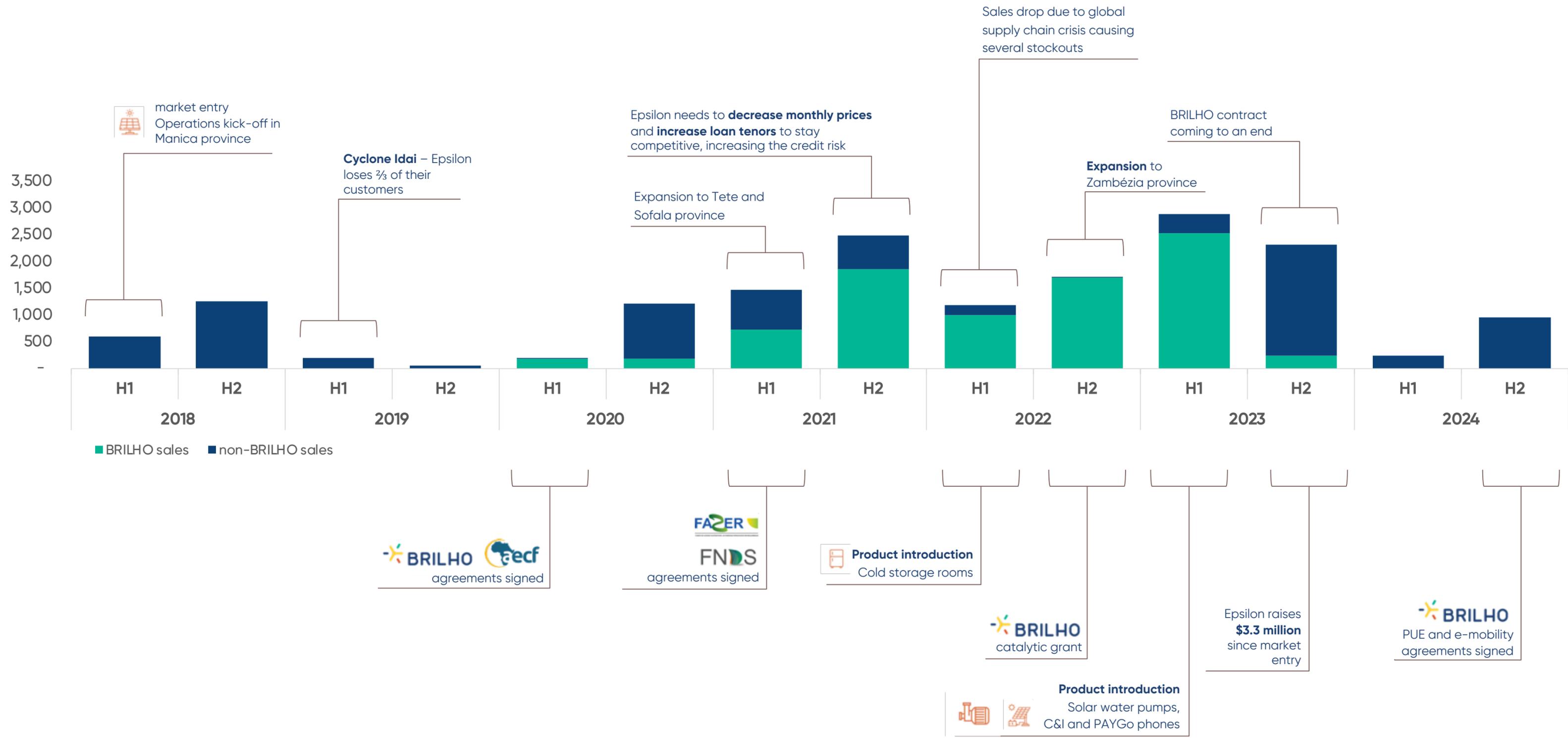
**TA:** Supported Epsilon in becoming ready for investment and better positioned to seek out financing. BRILHO was supported with credit management training and one-on-one support to improve PAYGo performance and develop their operations manual, which is a critical element of their development and growth.

Cumulative BRILHO-supported SHS sales





# Epsilon timeline - resilience through product diversification





CHALLENGES

**IDA1 cyclone**

- Most of Epsilon’s customers lost their SHS in early 2019 due to cyclones Idai and Kenneth
- The cyclones hit hardest in Mozambique's central region, the heart of Epsilon’s operation
- Epsilon had to write off 2/3 of its portfolio, putting the company in financial distress
- The FASER fund supported Epsilon with RBF funding targeted specifically to support customers in that region

**Credit management**

- Low collection rate remains the number one challenge in operating a PAYGo business
- Market pressure has led Epsilon to reduce monthly prices and increase loan tenors, increasing the portfolio risk
- Since September 2023, Epsilon has been introducing Credit Management best practices to improve portfolio performance, supported by BRILHO through the PAYGo Lab

**Market uncertainties**

- Epsilon fulfilled all their RBF contracts in the second half of 2023
- Epsilon is unable to sustain a PAYGo SHS operation in the absence of RBF financing
- The company stopped selling PAYGo SHS in early 2024, and will resume its operation only if there are active programs that support the market

OUTLOOK

**Product diversification**

- Epsilon is leveraging the PAYGo expertise to provide asset financing for a wider range of products
- Epsilon is diversifying its product offering from PAYGo SHS to PAYGo phones, solar water pumps, standalone solar PV, cold storage solutions, and e-mobility
- This is part of Epsilon’s strategy to be less dependent on grants and have multiple revenue streams



260,000+ SHS products sold



150 FTE employees  
650 sales agents

£ 5,700,000 in BRILHO funding



Selling under the brand MySol in Mozambique, ENGIE is a leading off-grid, PAYGo solar solution company across 9 African countries, positively impacting over **10 million lives**. ENGIE is committed to delivering affordable, reliable, and sustainable energy solutions, enabling customers to pay conveniently through mobile money in their journey towards a brighter future.

Thoughts from ENGIE Country Director, Alexandra Links:



**What's ENGIE's strategic vision?** "ENGIE Energy Access has a clear strategy focused on operational excellence, geographic expansion, product scaling and cost optimization, aiming to reach over 30 million people in 2030. Our vision is to combine different off-grid solutions into a multi-technology approach with a commitment to people & customers."

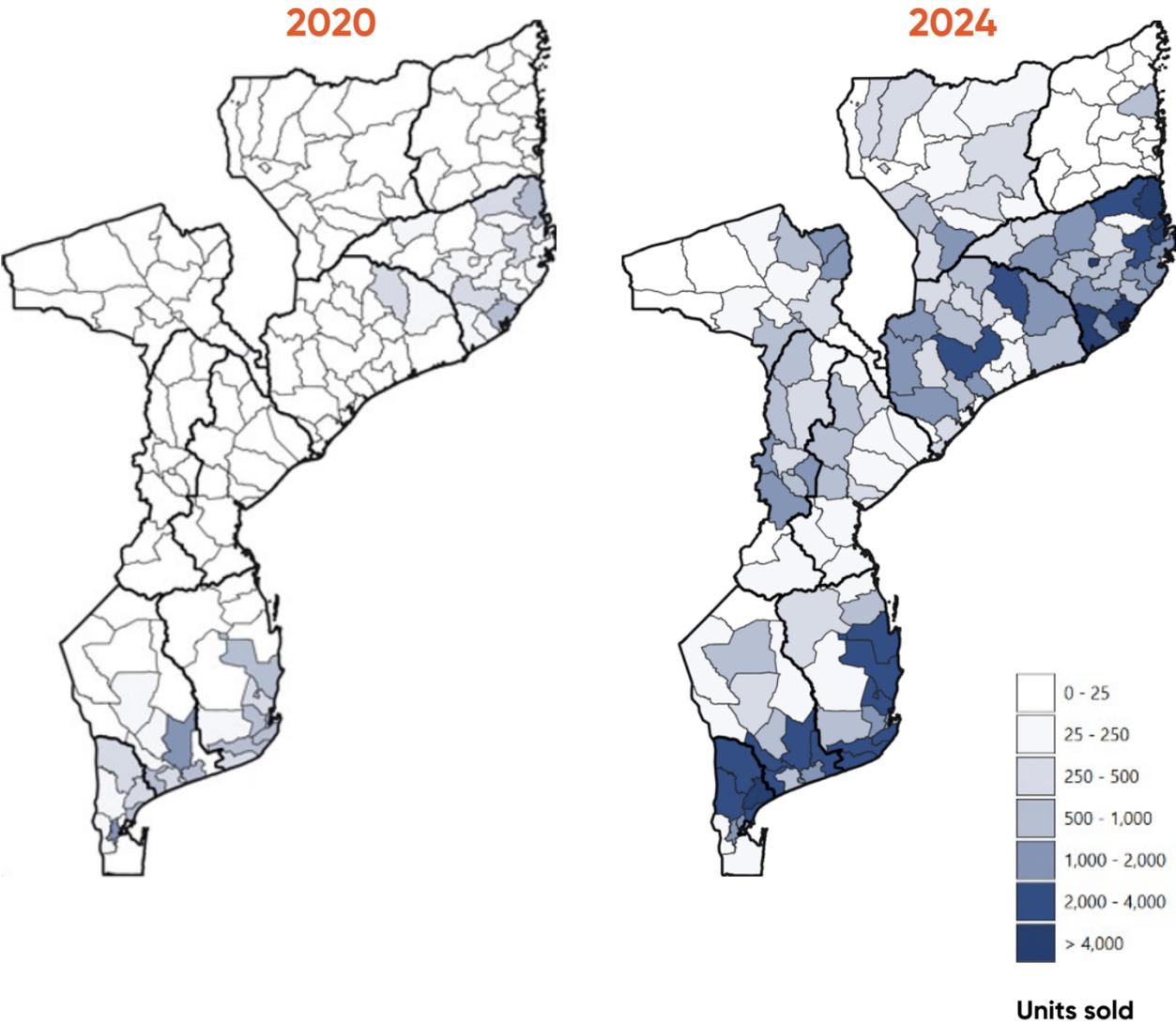
**What would be the most impactful single action BRILHO and others could take over the next 2 years to support Mozambique's SHS market?** "ENGIE welcomes and needs support from programmes like BRILHO to continue providing energy access in remote regions. Alongside providing RBF, programs should address affordability aspects as most people still can't afford an entry-level SHS. Additionally, programs should not only reward the quantity of new connections, but the quality of the portfolio which is an indication of how many people are really using the systems."

BRILHO's support to ENGIE:

**RBF:** RBF subsidies allowed the business to boost its sales numbers. BRILHO provided RBF financing to over 139,000 sales between 2020 and 2024. This represents over 50% of all ENGIE sales in that period.

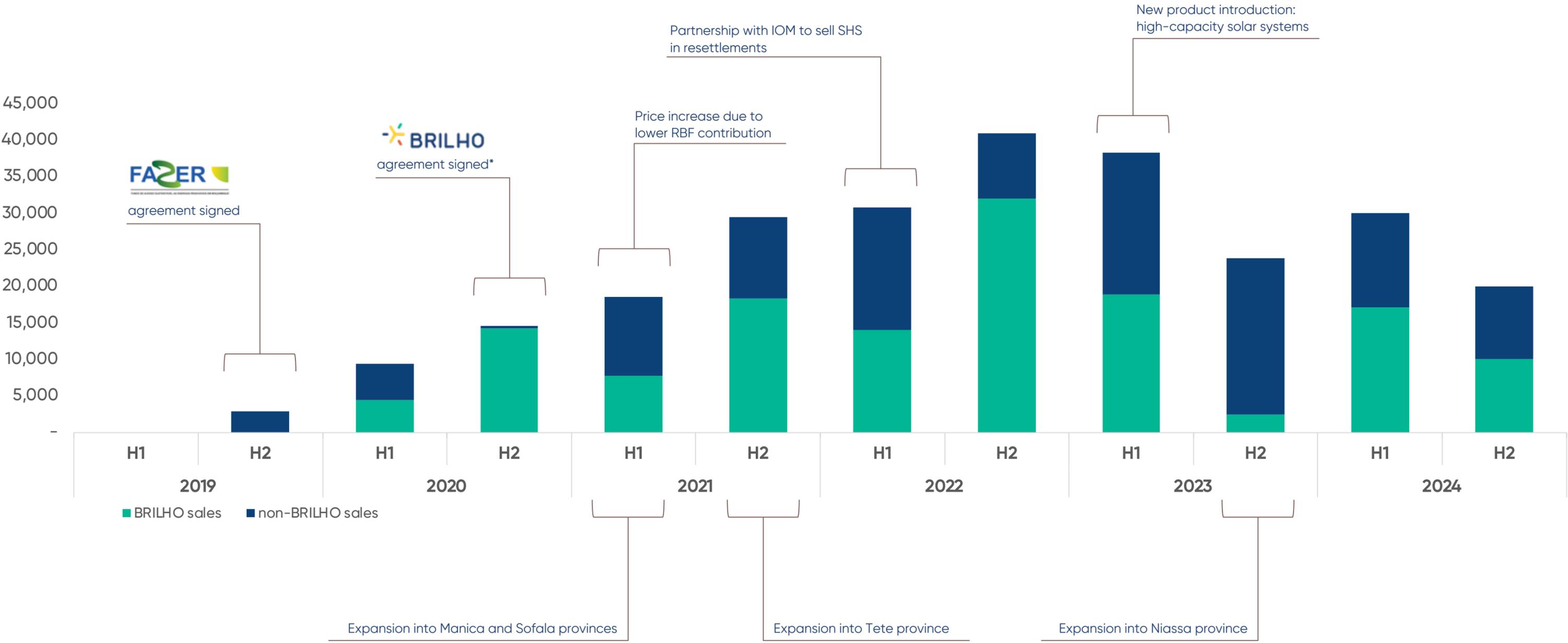
**CG:** ENGIE received a CG from BRILHO which helped to expand operations to Niassa province.

Cumulative BRILHO-supported SHS sales





**ENGIE timeline** - ENGIE has sold an impressive number of SHS to date, but RBF uncertainty led to reduced sales from the second half of 2023.



\* BRILHO supported sales retroactively for H1 2020



**Tackling market and business challenges** - despite impacting a significant number of people in Mozambique, ENGIE's challenges show the importance of coordination among stakeholders.



CHALLENGES

**Credit management**

- High default rates are one of the key challenges that ENGIE is facing.

**Market uncertainties**

- In 2023, ENGIE successfully met its targets across all programmes. However, by the second half of 2023, most sales were no longer supported by RBFs, leading ENGIE to inevitably increase its prices, which in turn impacted sales volumes. The business is not yet profitable and continues to rely on RBF support to share the associated risks and costs.
- Uncertainties around the extension of existing programs and the kick-off date of new programmes led the company to scale back operations, reduce sales and even close some stores and regions.

**Affordability**

- Most of the population that requires SHS can only afford to spend USD 3-4 per month on energy services. With the current average monthly price at USD 7 there is a significant affordability gap. High import duties and VAT, cost of consumer financing, and high operation costs to reach the rural population are the key challenges to reducing prices.

OUTLOOK & SUPPORT NEEDS

- Programmes should be well coordinated to avoid overlapping of regions and efforts. They should not be competing but be complementary, as there is still a huge market potential to be tapped.
- Programmes should not only incentivize the number of sales but focus as well on long-term sustainability both for the private sector and the customers. Portfolio quality should be incentivised through metrics like the days that the customer is actually using the system.
- Programmes should carefully assess the business viability and should avoid supporting companies that can distort the market, for example through prices way below the market average.
- To address the affordability gap, programmes should subsidise pico-solar systems, ensuring quality and customer service, to be sold on a cash basis to the population that can't afford SHS.
- The government should consider fiscal incentives for certified operators (ARENE and Verasol) and VAT exemption or reductions to reduce product costs and benefit more households.



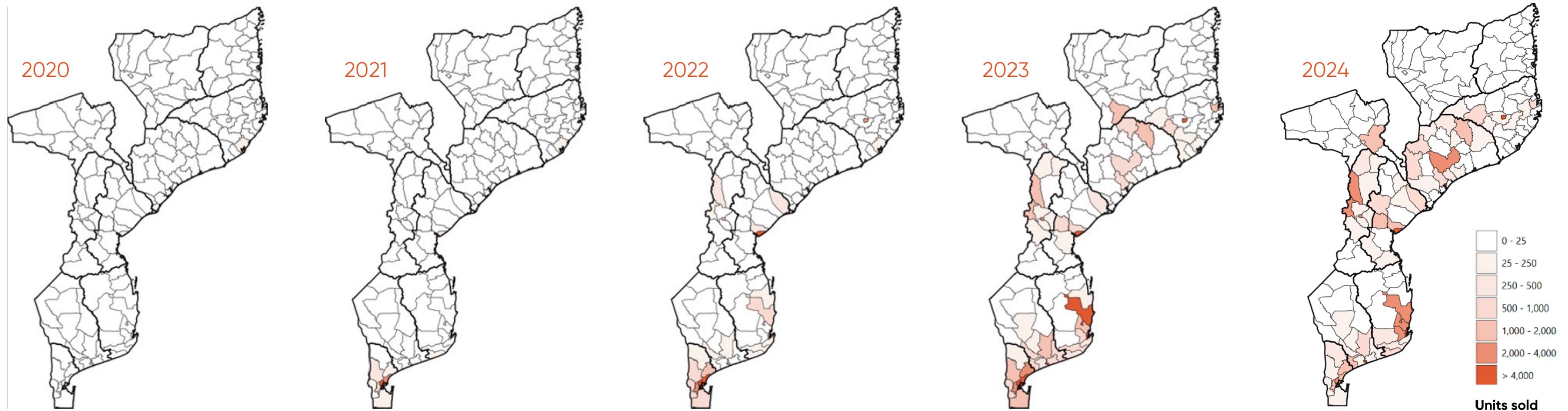
# Improved Cooking Solutions



BRILHO enabled increased **equitable access to clean cooking** across Mozambique.

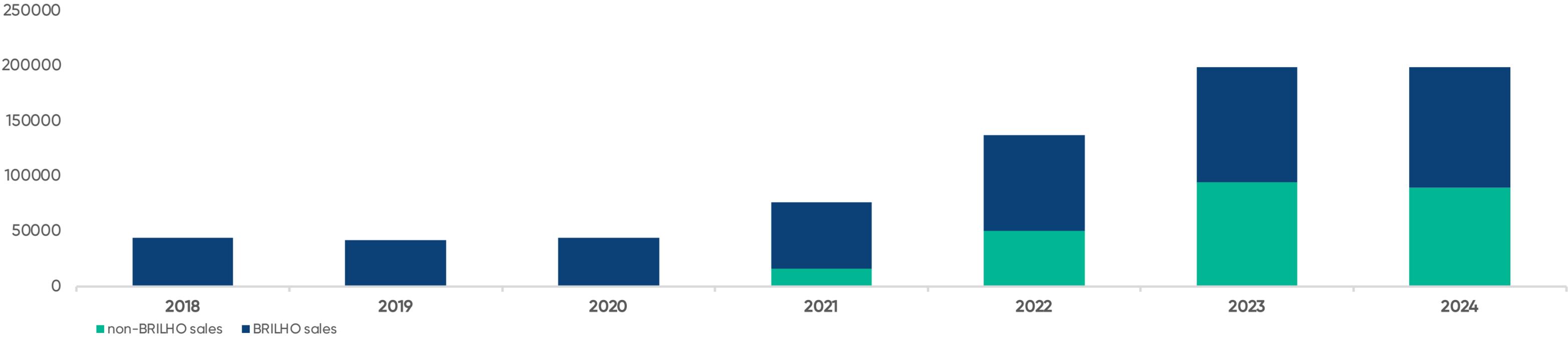


### BRILHO-supported ICS Sales 2020-2024



- In **2020**, BRILHO was in the early stages of supporting the ICS market and was funding two companies with a presence in Nampula (north) and Maputo (south) provinces. RBF bonuses for ICS targeted the most vulnerable regions and entry-level service tiers.
- In **2021**, six companies benefited from BRILHO funding, but **94% of ICS sales were concentrated in Maputo province**.
- In **2022**, companies started **expanding into other provinces**, incentivised by the market potential and increased BRILHO RBF subsidies for remote regions.
- In **2023 and 2024**, sales occurred more evenly across the country, **reaching the most vulnerable provinces** in central and northern Mozambique. The use of carbon financing and product diversification also helped boost expansion into more rural market segments.
- **To date**, the provinces of **Tete, Niassa, and Cabo Delgado remain unserved** partially due to prevailing armed conflict in the north and operational difficulties.

**BRILHO support directly enabled market growth**, contributing to over 60% of total ICS sales since 2021.

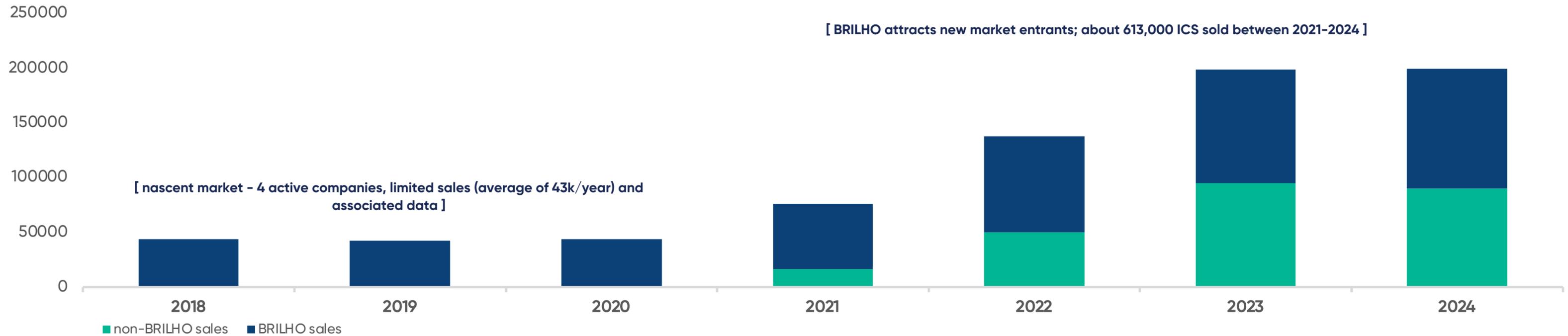


Source: data self-reported by companies; BRILHO company reports

**Here's how this market evolution played out:**

- **Before 2018:** the ICS market was nascent, with only two active companies and limited sales data available.
- **2018-2020:** In the years preceding BRILHO, ICS sales averaged 43,000 annually. In 2020, BRILHO funding attracted international firms, and a new chapter started, setting off a significant surge in sales.
- **2021-2024:** Over 770,000 ICS were sold through 2024, with 70% of sales occurring between 2022 and 2024. BRILHO provided RBF to 252,000 of the ICS sold since 2021. BRILHO's market contribution rose from 22% in 2021 to 45% in 2024, peaking at 48% in 2023.

# BRILHO was instrumental in supporting ICS market growth from 2021.



## 2018-2020: Nascent market

- There was little growth during that period due to:
  - Limited grant financing to facilitate market entry and scaling.
  - Carbon market opportunity in Mozambique remained opaque.
  - Most ICS were imported meaning higher capex costs and cash flow constraints as companies had to import in bulk.
- EnDev (2013) provided technical assistance which helped prepare the market pre-RBF financing.
- FASER (2018) and AECF REACT (2019) brought critical financing to kickstart market growth.

## 2021-2024: Stable market growth

- **BRILHO** catalyses market growth for 5 incumbent companies and attracts 2 more companies to enter Mozambique.
- Funding from **AECF** (catalytic grants) and **FASER** (RBF) help bolster the market.
- **Carbon markets** find traction in Mozambique – though challenges persist.
- Some companies transition from importing ICS to **local manufacturing**, enabling lower retail pricing.
- Companies **diversify their product offerings** to tap different market segments.
- **+Energia** programme launches first call for proposals end of 2024



210,000+  
products sold



75 FTE employees  
350 sales agents

£ 1,100,000 in BRILHO  
funding



MozCarbon is at the forefront of providing solutions to the global climate crisis challenge. They do this by implementing projects that reduce carbon and other greenhouse gases emissions whilst improving livelihoods in urban and rural communities. The company is the largest local producer and distributor of improved cookstoves in Mozambique with distribution centres in Maputo, Gaza and Inhambane Provinces.

Thoughts from MozCarbon CEO, Goodmore Chatora:



What's MozCarbon's strategic vision?

"We aim to be the leading company in the mitigation of the negative impacts of climate change in Mozambique. Soon, we aim to expand our production facilities and distribution of improved cookstoves to all provinces in Mozambique."

What would be the most impactful single action BRILHO and others could take over the next 2 years to support Mozambique's ICS market?

"In addition to RBF, donors should support local businesses with Grants because these assist in financing acquisition of much needed new machinery for production and fund expansion programs, especially in remote areas."

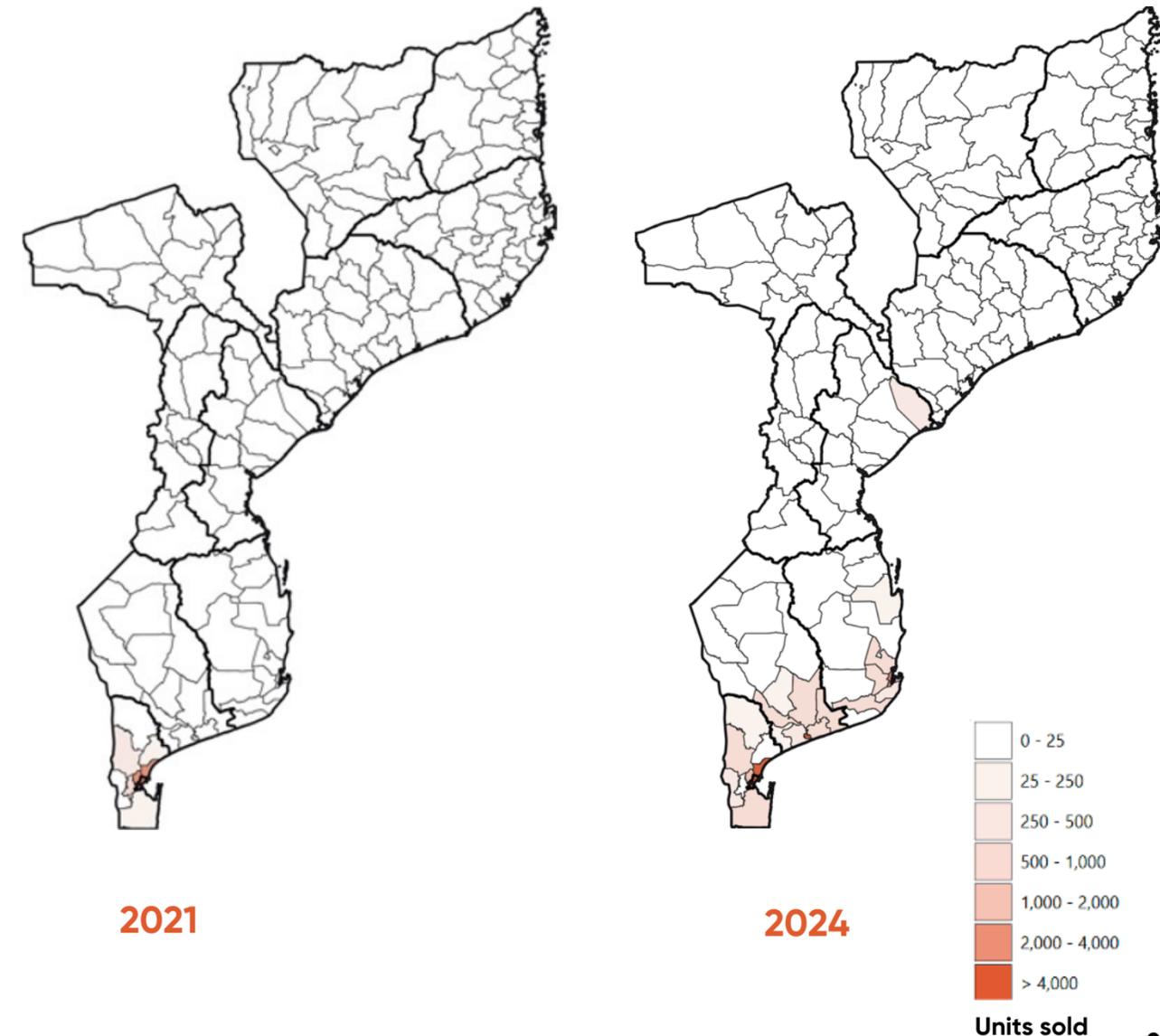
BRILHO's support to MozCarbon:

**RBF:** RBF subsidies allowed the company to boost sales volumes, from an average of 17,000 sales in the 2017-2020 period to an average of almost 40,000 between 2021 and 2024.

**CG:** Helped the company to access capital for setting up local manufacturing facilities. Local production helped reduce stove costs and increase sales volumes.

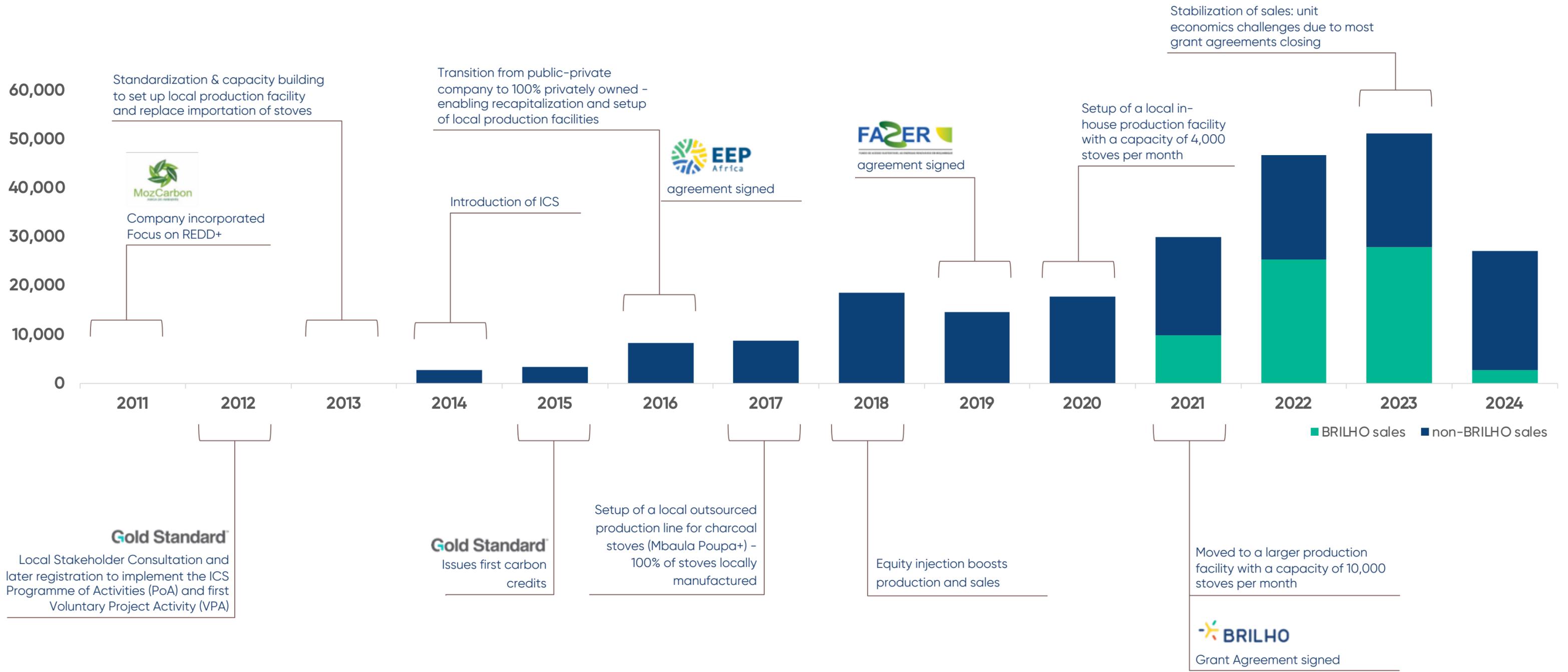
**TA:** Supported MozCarbon in becoming ready for investment and better positioned to seek out financing. BRILHO provided one-on-one support to assess investment readiness and improve key company documents, such as business plan, pitch deck and developing a CO<sub>2</sub> Impact Tracker tool.

Cumulative BRILHO-supported ICS Sales





# MozCarbon timeline - a success story of the first ICS company in Mozambique.





**Carbon markets:** MozCarbon's experience shows how complex this opportunity can be.



CHALLENGES

**Carbon markets**

MozCarbon was the **first ICS company in Mozambique to earn carbon certification** through GoldStandard in 2015. However, the **certification process was slow** which affected cash flow significantly. As a result, the company had to rely on shareholder support and the intervention of programs like BRILHO to address this challenge.

Negative press in 2023 about cookstove carbon credits led to price reductions internationally. While the certification process is essential to improve the integrity of carbon emissions reduction calculations, the constantly changing methodologies and rules are costly and slow down the accreditation process.

**Local currency financing**

Local banks posed additional financing challenges due to their lack of confidence in the carbon market and the business model. However, they have recently begun attending conferences on carbon credits, which is helping to raise awareness and understanding.

OUTLOOK & SUPPORT NEEDS

Moving forward, MozCarbon emphasizes the need to address the low prices of African carbon credits compared to other international markets and to boost buyer confidence in African carbon credits, especially from small to medium-sized project developers. The industry awaits the implementation of the Africa Carbon Market Initiative (ACMI) in Mozambique and anticipates that carbon pricing will be addressed. MozCarbon also advocates for the development of an SADC emissions trading scheme, like the EU Emissions Trading System.

Moreover, MozCarbon believes that local banks should facilitate the mobilisation of international financing to provide low-cost financing and support the pricing structure of improved cooking technologies.



122,000+ products sold



46 FTE employees  
142 sales agents

£ 1,300,000 in BRILHO funding



BURN is transforming the way clean cookstove manufacturers produce and deliver stoves. By providing innovative and affordable manufacturing solutions that empower entrepreneurs in developing countries to build and scale their businesses, ultimately saving lives and combating climate change.

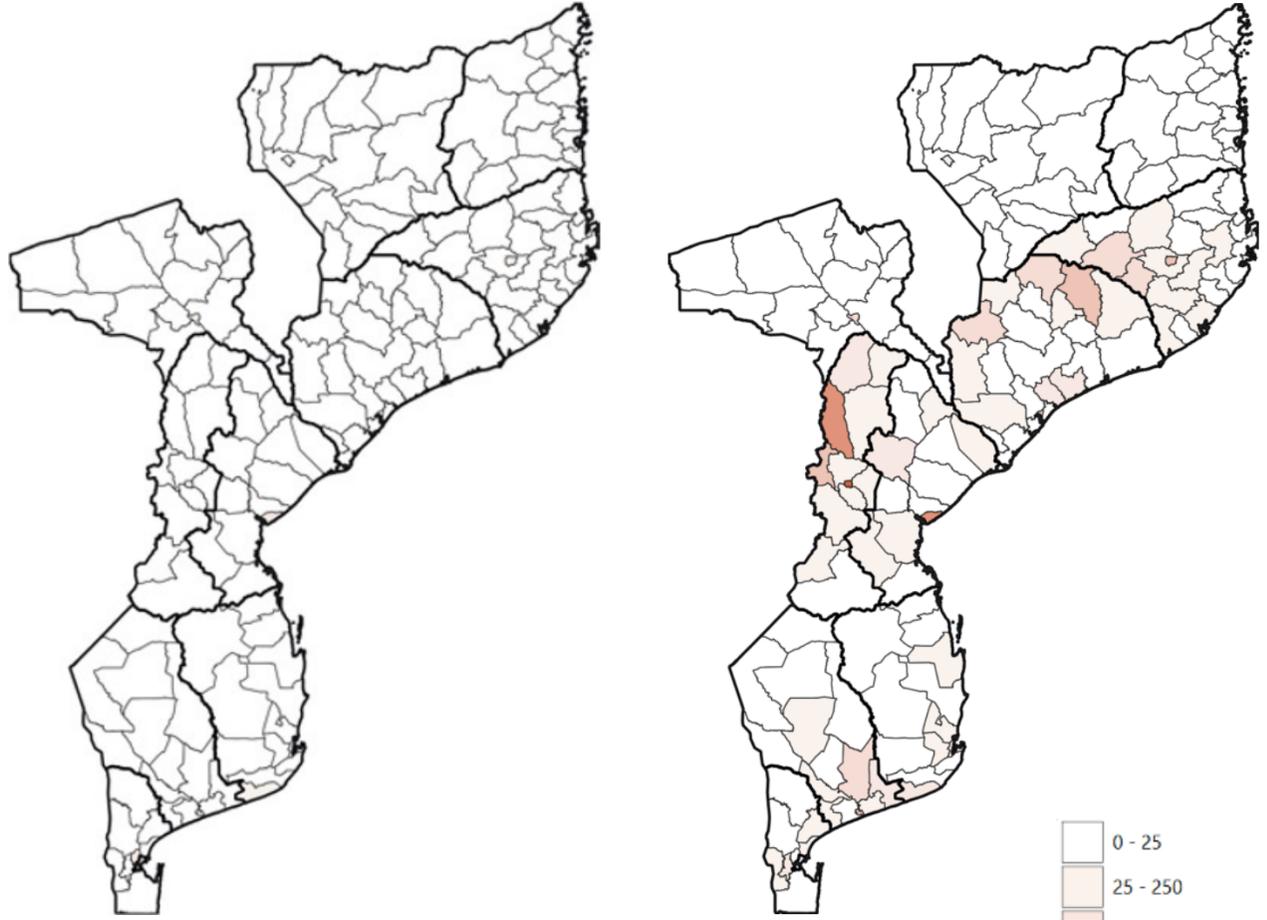
Thoughts from William Dale Manhacaze - Burn Mozambique Country Manager



**What's Burn's strategic vision?** "Over the coming years we expect to expand our geographical reach, both within existing and new markets, and offer new and improved products tailored to local demand. We aim to work with partners that are aligned with our vision and mission and seek collaborations with governments to improve access and affordability."

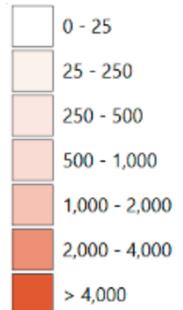
**What would be the most impactful single action BRILHO and others could take over the next 2 years to support Mozambique's ICS market?** "BURN has been successful in raising money through carbon financing. However, the high-risk nature of introducing new products to the market has made prospective funders cautious about being the first to invest, necessitating support from aligned, more risk-tolerant funders."

Cumulative BRILHO-supported ICS Sales



2021

2024



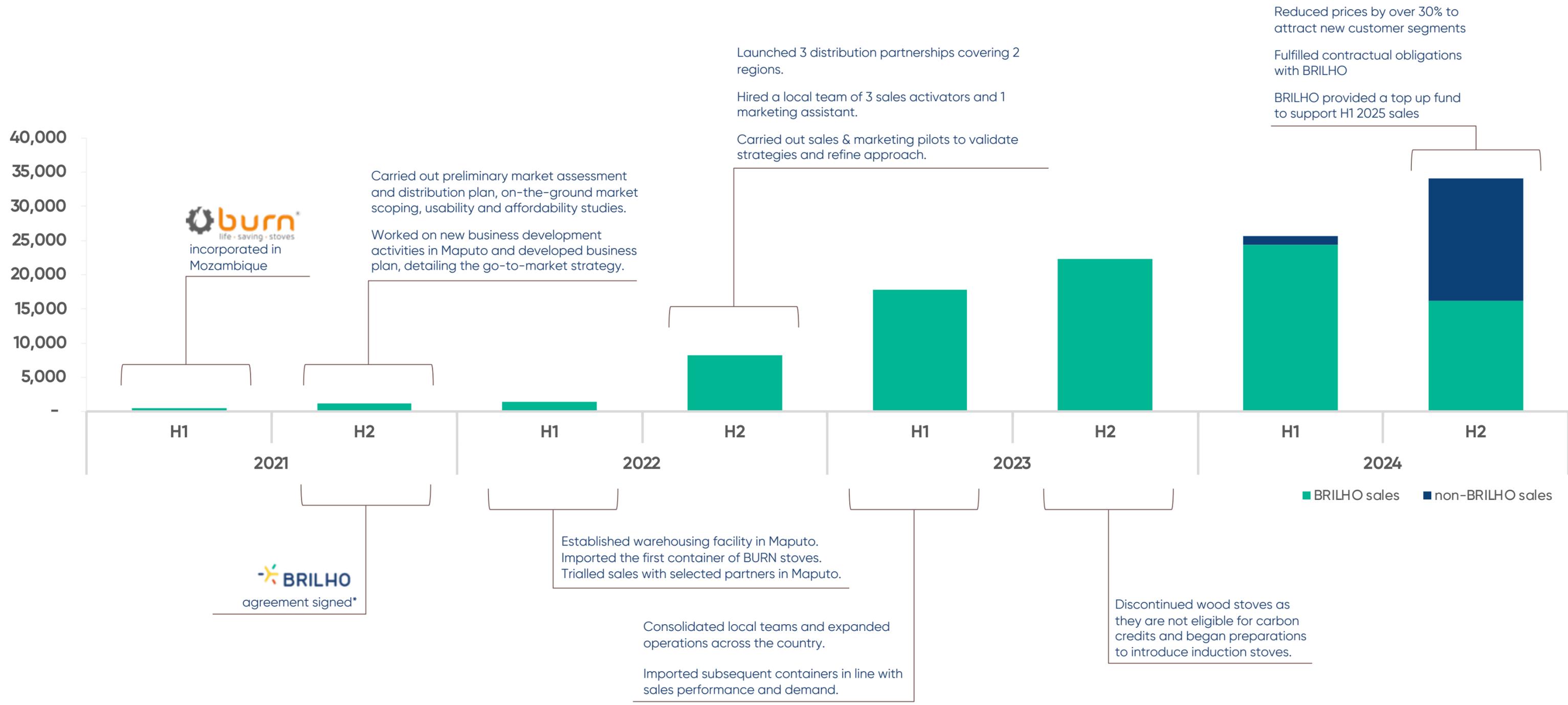
BRILHO's support to Burn:

**RBF:** enabled Burn to upscale the business and boost sales. All sales made by Burn since its inception were supported by BRILHO RBF.

**CG:** Catalytic grants covered some of the company's capital expenses and operational expenditures and were crucial to upscale the business.



**Burn timeline** - rapid growth after a period of consolidating operations and business model.



\* BRILHO supported BURN sales retroactively since the company's inception



**Tackling market and business challenges** - Burn's experience shows the challenges of entering and setting up operations in a new market.



## CHALLENGES

### Setting up operations

Starting an ICS business in a new market can be a **slow process** and it was no different for Burn in Mozambique. Establishing business activities in Maputo faced **regulatory and cultural hurdles**, which required adaptation strategies, and crafting a business plan for Mozambique was complicated by limited local insights. **Logistical challenges** in securing warehouse facilities and importing goods led to delays while conducting trial sales and encountered resistance and alignment issues. Challenges in **establishing distribution partnerships, hiring local teams**, and **executing sales pilots** further complicated the business's growth trajectory, necessitating continuous adjustments and iterative improvements to overcome obstacles and achieve success in the target markets. A 16% VAT rate and 20% customs duty have also presented challenges.

## OVERCOMING CHALLENGES

Burn engaged **legal advisors**, implemented **cultural sensitivity training**, and adopted **flexible business planning** processes to navigate regulatory, cultural, and economic challenges. As a result, Burn has a good footing in the Mozambique market and is poised for expansion.



# Green Mini- Grids



With significant contributions from BRILHO, Mozambique's mini-grid market is poised for growth.



Historically, the mini-grid market was led by the public sector; FUNAE developed 111 mini-grids with a total capacity of 11.58 MW. **A main constraint to private sector involvement in the sector was the lack of a robust mini-grid regulatory framework.**

Since 2020, BRILHO has worked hand in hand with the Ministry of Mineral Resources and Energy (MIREME), the Energy Regulatory Authority (ARENE), and the Energy Fund (FUNAE) on the **development and operationalisation of Mozambique's first off-grid regulatory framework.**

This framework, approved between September 2021 and June 2023 opens the door to private sector participation in the mini-grid market by tackling critical elements such as mini-grid concessions, cost-reflective tariffs, and grid interconnection.

These changes were also visible in **Mozambique's RISE\* score for mini-grid framework, which rose from 23 in 2020 to 61 in 2021.**

In 2023, supported by BRILHO financing, Mozambique's **first privately owned and operated mini-grid** was commissioned by ARC Power.



\*RISE is a set of indicators to help compare national policy and regulatory frameworks for sustainable energy. It assesses countries' policy and regulatory support for each of the four pillars of sustainable energy – access to electricity, access to clean cooking, energy efficiency, and renewable energy.

BRILHO provided hands-on capacity building to the Government of Mozambique crucial to the development and implementation of the off-grid regulations.



Photo credit: BRILHO/SNV

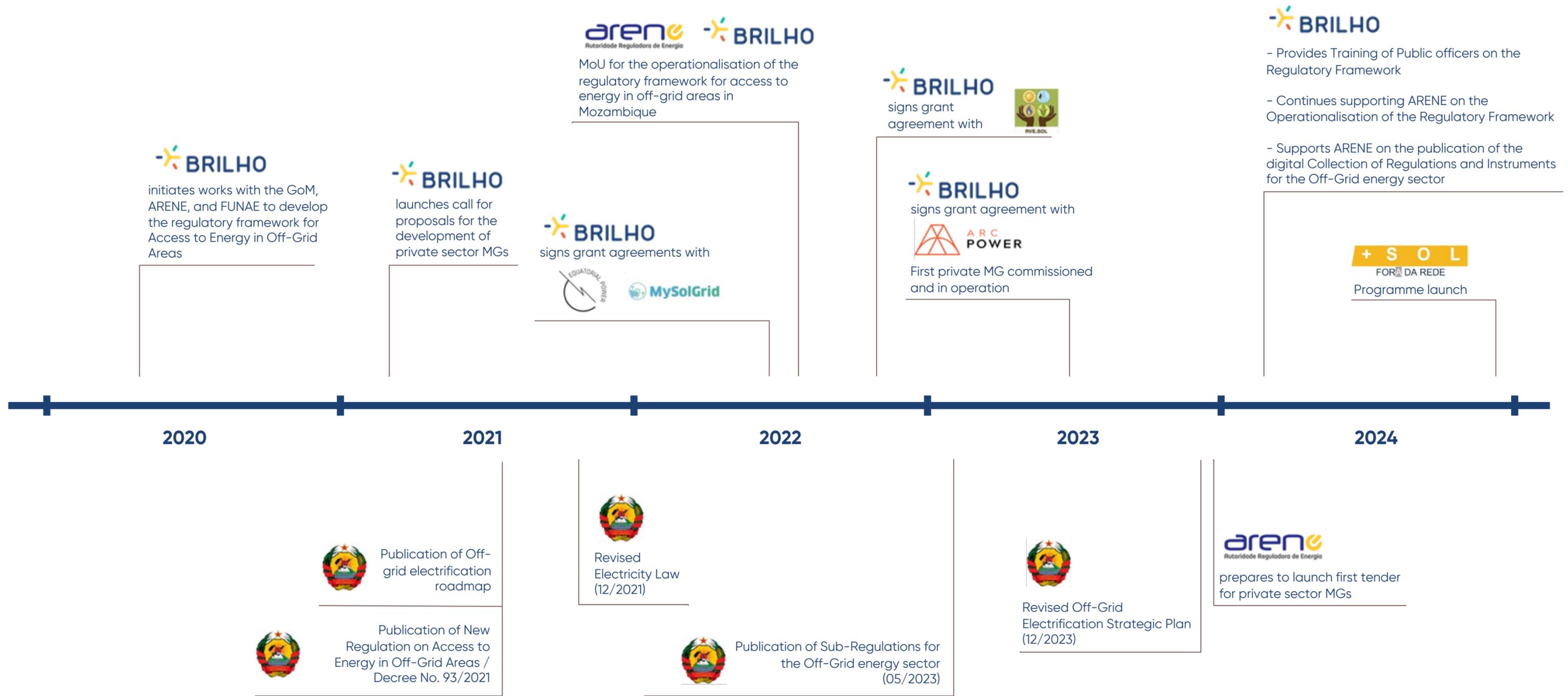
***"This regulatory framework for off-grid energy is solid, resulting from intense work that was led by the Government of Mozambique and with continued support from SNV-BRILHO. We are committed to the development of the off-grid energy sector, where the private sector plays a central role. The private sector is recognized as a partner of the Government on this path for the country to achieve universal access targets by 2030."***

**Dr António Osvaldo Saíde**

Vice - Minister  
Mineral Resources and Energy (MIREME), Mozambique

**November 2022**

# BRILHO was instrumental in supporting the Government of Mozambique to design and operationalise the mini-grid regulatory framework



# Mozambique's off-grid regulatory framework underscores GoM's commitment to quality electricity services delivered by the private sector



Name of regulation/law*	What this does for the mini-grid market
<b>Regulation on Access to Energy in Off-Grid Areas</b> Decree N° 93/2021 of December 10	Strengthens legal framework for off-grid energy supply, including energy services and mini-grids up to 10 MW. It promotes universal access to energy and socio-economic development in Mozambique, as well as promoting private sector investment.
<b>Regulation for the Award of Mini-grids Concessions</b> Decree N° 68/2023 of May 31	Establishes simplified procedures for the award of mini-grid concessions; encouraging private sector participation and investment in mini-grid projects.
<b>Certificate of Registration of Energy Service Provider</b> Decree N°84/2023 of June 7	Formalizes the granting, modification, extension, and cancellation of rights and obligations of energy service providers. Ensures that energy service providers are properly registered and regulated, maintaining quality and reliability in service provision.
<b>Tariff Regulation for Mini-Grids in Off-Grid Areas</b> Normative Resolution N°1/ARENE-CA/2022 of December 19	Ensures cost recovery for mini-grid operators, reasonable return for investors, tariff stability, fair sharing between the operator and the final consumer, and transparency, simplicity, and efficiency in its formulation, approval, publication, as well as supervision.
<b>Mini-Grid Interconnection Regulation</b> Normative Resolution N°2/ARENE-CA/2022 of December 19	Establishes technical and regulatory framework for mini-grid interconnections (with main grid or other mini-grids); facilitates mini-grid integration into the power system, enhancing its reliability and efficiency; ensures investment security through compensation to private sector in case of a cancelled concession.
<b>Technical and Safety Standards Regulation</b> Normative Resolution N°3/ARENE-CA/2022 of December 19	Ensures high standards of safety and quality of off-grid mini-grids and autonomous systems, protecting consumers and infrastructure.
<b>Quality of Service and commercial relations regulation</b> Normative Resolution N°4/ARENE-CA/2022 of December 19	Regulates quality of service, commercial relationships between energy providers and consumers; ensures consumers receive reliable and high-quality service and establishes clear guidelines for commercial interactions.

\* All the regulations listed in the table were already approved and published

# What this means: a mini-grid market primed for private sector participation



	STATUS QUO	NEW PATHWAY
Ownership & Timeline	Public (FUNAE) : All MGs through 2022	Private sector: since 2023
Concession	<ul style="list-style-type: none"> <li>- Public tenders launched by FUNAE</li> <li>- Private sector involved in importing &amp; building MGs</li> <li>- FUNAE responsible for short and medium-term operations &amp; maintenance</li> </ul>	MG concessions are awarded through public tender (launched by ARENE) OR through a spontaneous application from MG developers. There are three concession categories depending on MG capacity (1,001 kW–10 MW; 151 kW – 1 MW; up to 150 kW). Concessions are valid for up to 30 years.
Tariffs	Subsidised tariffs that match national grid "social tariff"; some MGs charge a monthly flat rate due to lack of metering systems to measure consumption	Cost-reflective tariff, ensuring return to investors. Tariff calculated based on costs; tariff can be structured based on kWh, fixed tariff, or capacity charges; Tariffs are subject to public consultation, review and adjustments to ensure fairness
Status	111 MGs (installed, under operation, and planned) 11,582 kW installed capacity (~104 kW per MG) FUNAE is planning to transfer of some of these MGs to the private sector	<ol style="list-style-type: none"> <li>1. ARENE launches the first public tender in H2 2024 for 72 MGs in central and northern Mozambique</li> <li>2. ARC Power builds and operates the first private MG through a spontaneous application concession process</li> </ol>
Remaining Challenges & Risks	<ul style="list-style-type: none"> <li>● Operation and maintenance of existing MGs, with several MGs underperforming due to unresolved technical issues</li> <li>● Limited experience with private sector led MG business models in the public sector, given the novelty of these approaches</li> <li>● Limited involvement of private sector</li> <li>● Unclear business model for MGs that FUNAE will transfer to private sector; Low Social Tariffs or Flat Rates make most MGs unviable for private sector</li> <li>● Age of MGs (many more than 10 years old) and low system installed capacity presents a risk for O&amp;M</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Operationalisation of off-grid regulation</b> and sub-regulations: while regulations present the necessary framework to support market growth, establishing all processes (e.g., reviewing applications or tariff approvals), document templates, setting up teams and building capacity requires time, financial resources and technical know-how</li> <li>● Unclear <b>project feasibility of tendered sites</b>, both from a technical and financial perspective (e.g., load estimations, ability to pay assumptions, and allowed tariffs are unclear and need to be verified by private developers)</li> <li>● While there is a clear electrification strategy, an improved and clear <b>masterplan for allocating mini-grid sites</b> in all provinces would enhance investment potential and foster transparency between stakeholders</li> <li>● Subsidies remain instrumental in financing the project viability gap, as <b>cost-reflective tariffs are unviable</b> from a consumer acceptance perspective</li> <li>● Potential risk of consumer dissatisfaction if different MG concessions in proximity to each other get differentiated tariffs</li> <li>● <b>Key stakeholders (public, private, donors, and investors) need to strengthen coordination</b> to foster more effective collaboration and shared success</li> <li>● <b>Accessing financing</b> (including local financing) has been proven challenging for the private sector</li> <li>● Difficulty in <b>promoting productive use of energy</b> due to unclear market potential, and limited strategic partnerships to work on value chain development</li> <li>● Initial surveying by private sector indicates that population in some tendered sites don't have <b>access to telecommunication services</b>, essential for MG operators</li> </ul>



1 mini-grid operational in Mozambique



30 FTE employees

£ 404,000 in BRILHO funding



ARC Power developed through becoming the largest mini-grid developer and operator in Rwanda. ARC Power sought to address the challenges faced by both national and private organisations to provide on-grid and off-grid energy generation and distribution infrastructure in a commercially viable way. They expanded into Mozambique in 2022. ARC Power is unique in that it manages all project phases in-house, from engineering and software development to distribution and operation. The lack of a connection fee to customer is a unique selling point and allows the company to quickly connect many households and businesses once the mini-grids are built. ARC Power has distinguished itself as the **first private operator to own and operate a mini-grid in Mozambique**, setting a precedent and achieving a significant milestone in the evolution of the country's energy sector.

Thoughts from ARC CEO, Karl Boyce:



**What's ARC's strategic vision?** *"We are excited about the Mozambique market and with the new regulatory framework being finalized, we hope to scale operations and investment there significantly over the next 18 months. Currently, 80 sites have been identified and are undergoing a detailed assessment. 16 of these have been thoroughly evaluated and are being submitted to ARENE for approval, marking a significant step forward in the expansion initiative."*

**What would be the most impactful single action BRILHO and others could take over the next 2 years to support Mozambique's mini-grid market?** *"Besides providing financing support through RBF and other grants, BRILHO should continue to provide support to the Government of Mozambique to ensure a smooth operationalisation of the regulatory framework. This is essential to enable private sector investment and reach universal electrification in Mozambique."*

Spotlight: Innovative business models

ARC Power is currently pioneering the Strategic Power Partnership (SPP) business model in Rwanda, an initiative aimed at enhancing the national grid with **Hybrid Distributed Renewable Energy** mini-grids. This innovative approach not only promises to broaden the national grid's reach but also aims to bolster its stability and reliability. Tailored to match consumption patterns, these grid-connected mini-grids are designed to potentially operate without the need for Battery Energy Storage Systems, thus lowering the overall cost per connection. Looking ahead, ARC Power is keen on replicating this model in Mozambique, concurrently with the deployment of their fully off-grid mini-grids, to further test its efficacy and scalability.

BRILHO's support to ARC Power:

**RBF:** RBF subsidies are allowing the company to subsidize part of the energy cost to the customer.



# ARC Power - the story of the first privately owned mini-grid in Mozambique



CHALLENGES

Since June 2023, ARC Power has been collaborating with ARENE to formalise its current concession, especially in setting consumer tariffs. This process, essential for each future site installation, has proven to be an extended **process as this represents a first case in country**. The challenge lies in the need for a complete concession request, practicalities related to the operationalization of the regulatory framework and assessment of tariffs. As the first project of its kind, this process has been a valuable learning experience for both parties.

**Until the concession is formally approved, ARC Power remains ineligible to access grant funding from BRILHO**, emphasizing the critical nature of these negotiations. To become a profitable business, ARC Power needs to scale, increasing the number of mini-grids built and in operation. The regulatory framework to achieve this is now in place, but putting the regulations in practice still has proven to be a burdensome process.

OVERCOMING CHALLENGES

### Tariff approvals

ARC Power has suggested ARENE assess the feasibility of **simplifying the tariff approval process**, such as by establishing tariffs per province instead of for each individual site. While the initial approval process has been slow, it has allowed for the **development of a framework that allows ARENE to expedite more approvals in the future**. Adopting this streamlined strategy could significantly boost the deployment of mini-grids, accelerating progress toward national electrification objectives.

### Other regulatory burdens

ARC Power is working closely with ARENE and BRILHO to speed up the concession process.

## Key Dates in ARC Power's journey

- ✈️ **October 2021** - concession signed with GoM
- ✈️ **December 2022** - site selection for ARC's first mini-grid
- ✈️ **June 2023** - grant agreement signed with BRILHO
- ✈️ **September 2023** - first MG operational in Gaza province with 350 connections
- ✈️ **December 2023** - Surveyed 80 sites for future grids





# Part 2

# Game Changers and Market Enablers

to accelerate Universal Energy Access

While progress has been made, there is still considerable work to do to achieve universal energy access in Mozambique by 2030. **At the current rate, this may not be achieved until 2035-2040.**



To date BRILHO and others have supported the sale of **700,000 quality-verified SHS** and **770,000 improved cooking solutions**. The Government of Mozambique is committed to providing universal access by 2030. In its Energy Transition Strategy (ETS), the Government estimates that to achieve this, 68% of the population will be electrified through the national grid and 32% through off-grid solutions such as SHS and mini-grids.<sup>1</sup> To reach 100% improved cooking, the ETS estimates that **70-90% of solutions will involve improved biomass stoves**. Given that only 22% of the population was able to afford a non-subsidized SHS in 2020<sup>2</sup>, there is also a significant risk that the most vulnerable will be left behind.

**However, there are opportunities for various stakeholders to help tackle each of these challenges and accelerate the transition to universal energy access. These game-changing opportunities include:**



Capitalise on **cross-cutting opportunities** to expand access to improved cooking solutions to help consumers switch to less polluting technologies and formalise a **regulatory market for carbon credits** to increase carbon financing.

**Rethink PAYGo** and revolutionise credit management practices to protect consumers and improve collection rates and revenues. Add **a sustainability component to RBF** that focuses on customer-centric metrics.

**Operationalise mini-grid regulations** and reduce obstacles for mini-grid developers.

**Cross-cutting:**

**Fiscal incentives** for VAT and import duties to reduce the costs of energy access technologies, making products more affordable for the most vulnerable. Provide **asset-financing** for off-grid solar technologies to increase financing options for consumers.

1. GoM, Energy Transition Strategy  
2. USAID, Can Mozambican Households Afford SHS? Insights From A Local Survey



## BRILHO RBF insights

BRILHO's RBF was **designed to deliver results - creating and accelerating the market**, while avoiding market distortions. The RBF was a huge success - directly supporting **375,000 SHS sales** between 2020 and 2024. **90% of its customers had first time access to energy**, many of whom had limited ability to pay for the cost of their systems and benefited from PAYGo.

Companies leveraged BRILHO financing to either **enter the Mozambican market** (e.g., SunKing), to **create a PAYGo business** (e.g., Dynamiss), **scale** (e.g., Uranus, Ignite), **unlock partnerships, reach remote regions** (e.g., ENGIE, SolarWorks), or **diversify product offering** (e.g., Epsilon). Most companies in this sector were still early stage and **required de-risking support** to build their businesses.

## Lessons learned

When measured through its main metric - **number of sales** - the RBF programme delivered significant impact.

Despite this, many companies report the **continued need for RBF**, noting challenges in becoming fully financially sustainable without them.

Industry data demonstrates that many customers **struggle to pay for their systems in a timely manner**, with some defaulting on their loans\*.

\* The Off-Grid Solar Market Trends Report 2024 indicates a 62% collection rate across the industry

## RBF Opportunity - "sustainability" component

**What:** to incentivise stronger customer repayment rates, which will enhance PAYGo company revenue realization and overall financial sustainability, add a "sustainability" incentive as part of the RBF.

**How:** reserve a portion of the RBF that would be paid contingent upon customer-centric metrics such as:

- Utilisation Rate (% of time the system is "unlocked") threshold
- Net Promoter Score (measures customer satisfaction)
- Customer Effort Score (measures after-care and customer service)

### Potential results

#### For companies:

High utilisation rate and customer satisfaction lead to more payments from customers leading to **higher revenue realisation and strengthened unit economics**.

#### For customers:

1. One of their major problems is solved - they now have **access to electricity services**.
2. Companies are assessing willingness and ability to pay, to **protect customers from over-financing**.
3. Utilisation rate increases - meaning customers can enjoy the life-changing services offered by their product.



### Challenge

- ✈ Traditional PAYGo companies focus mostly on **revenues**.
- ✈ They mainly **measure outputs**: sales volume and collection rate.
- ✈ They do limited customer screening, and mainly use down payments and verifications to assess the customer's capacity and willingness to pay.
- ✈ Call centres tend to focus on pushing customers to make payment.

As a result, **many PAYGo companies sell to customers who are unable to pay** for their products. This means many **customers lose access to their systems** (and the investment in it), leaving them **worse off**.

### Opportunity: PAYGo 2.0

- ✈ In PAYGo 2.0, companies focus on **customer care** – revenues are an outcome of good customer care.
- ✈ They mainly **measure inputs**: quality of credit assessment and quality of customer engagement.
- ✈ They conduct an affordability assessment for each customer, to minimise overfinancing risk.
- ✈ They provide a **cradle to grave customer relationship** – in which the focus is on building relationships with customers and offering structural solutions to structural problems. If a customer is having a problem paying, a PAYGo 2.0 company works with them to find a solution.

PAYGo 2.0 companies enhance customer experience while also strengthening their own balance sheets. **This customer-centric approach enhances customer satisfaction and repayment rates.**

PAYGo 2.0 necessitates the deployment of systems, processes, and capabilities across the organisation. **This change management journey requires time and strong leadership buy-in** to succeed.



Photo credit: BRILHO/SNV

### BRILHO's role

Since September 2023, BRILHO has been supporting five PAYGo companies to introduce Credit Management best practices and move their companies from PAYGo 1.0 to PAYGo 2.0.

Support is centred around four key pillars: dashboards, bootcamps, enterprise development support, and best practice customer screening and engagement apps.

**Results:** Companies showed an **immediate improvement in utilisation rate** of new customers - **from 66% to 78% on average** across the five companies within only 3 months.



### Challenge

- ✦ MFIs in Mozambique know how to assess and monitor customers. Their default rates typically are <5%. They also have better access to cheaper funding, namely deposits from their customers in local currency and/or loans from large financial institutions which typically are priced 5-10% below what PAYGo companies pay for their funding.
- ✦ **But, MFIs are not interested in providing financing to PAYGo clients because of:**
  1. **Geographic overlap:** MFIs in Mozambique operate branches in most of the district capitals, but they hardly reach the rural (and off-grid) segment, which is the core focus area to PAYGo companies.
  2. **Loan sizes:** to most MFIs doing individual lending in Mozambique, loan sizes of small SHS (<20W) are too small to fit their policies.
  3. **Risk perception:** most MFIs have no experience with "asset finance". They focus on cash loans with collateral and guarantors. Further, they often do not know how to operate the "PAYGo technology", which allows the PAYGo company to shut off a customer product once the client has not paid.

### Opportunity

**Support PAYGo companies in splitting off their asset-financing from sales and distribution entities after improving their credit management processes.**

- ✦ **Impact** - the credit company will continue to offer its services to the sales company's clients. However, it can over time also offer loans to clients from other PAYGo companies or other companies selling higher-value assets to rural clients. In fact, the company could even consider offering cash loans to its well-paying borrowers, which is an important tool that MFIs use to stimulate on-time payments.
- ✦ **Access to funding** - raising funding for a dedicated asset finance company will be easier and more affordable than raising funding for a combined PAYGo company. The credit company could tap financial sector funding rather than the much smaller pool of much more expensive off-grid electrification funding.
- ✦ **Access to best practices** - the credit company is well trained in asset finance for off-grid solar products and has access to a customer base in rural areas.



### Challenge

**95% of households** in Mozambique cook with polluting fuels and **17,000 people die prematurely** every year from household air pollution<sup>1</sup>.

For those on the grid, e-cooking **is already the cheapest way to cook**, due to the low electricity costs: USD 0.10/kWh regular tariff and a USD 0.02/kWh lifeline tariff for the first 100 kWh/month<sup>2</sup>.

However, the **upfront costs of switching** to electric cooking appliances **can be high**.

For those **off the grid**, encouraging the use of efficient biomass stoves is still necessary to reduce emissions, but again can be **cost-prohibitive**.

The challenge is further exacerbated by the lack of a regulatory framework for the clean cooking sector, despite the GoM's commitment to ensuring universal clean energy access by 2030.

1. Modern Energy Cooking Services Mozambique eCooking Market Assessment. Available from: <https://mecs.org.uk/wp-content/uploads/2022/02/MECS-EnDev-Mozambique-eCooking-Market-Assessment-presentation.pdf>

2. Ibid.

### Opportunity

Expanding access to charcoal, wood, and electric improved cooking solutions also capitalizes on other opportunities in this report. Here are some of these cross-cutting opportunities:

#### Crosscutting activities to promote access to improved wood, charcoal, and electric cooking:

- ✈ Companies should focus on customer-centric approaches to improve the user experience and increase willingness to pay and use ICS.
- ✈ Continue **RBF programmes** to incentivise stoves for end-users and **catalytic grants** to support local manufacturing.
- ✈ **Carbon credits** - emissions savings can easily be tracked and monetized, reducing costs (see [market enabler #5](#)).
- ✈ Reduce costs through **fiscal incentives** to lower product prices (see [market enabler #7](#)).
- ✈ Invest in behaviour change activities to create awareness of the economic and health benefits of improved cooking solutions, and increase willingness to pay for and use ICS.
- ✈ Support crowd-funding financing efforts for carbon projects.

#### Activities to promote electric cooking:

- ✈ Customer financing - options like PAYGo to make appliances affordable.
- ✈ Supports other business models - e-cooking can provide a source of load for solar mini-grids, increasing their revenues.



### Challenge

Mozambique is a **pioneer in forest carbon credits**, being the first country to receive payments from the World Bank's Forest Carbon Partnership Facility in 2021 for a REDD+ project in Zambézia. The country saw a **surge in carbon market activities** across various sectors, with 1.7 million credits issued in 2022. **Carbon credits could expand access to ICS for the estimated 40% of the population who can't afford them now.** However, there are some challenges to this:

- ✦ **Lack of a regulatory framework:** uncertainty about how projects should be run, how carbon credits are issued, verified, and traded can deter investment and project development.
- ✦ **Limited institutional capacity:** insufficient expertise within existing institutions, inadequate technological infrastructure, and limited financial resources to effectively manage and expand carbon market initiatives.
- ✦ **Lack of a national database on carbon projects:** without a centralised system to track and manage carbon projects, it's challenging to monitor progress, enforce regulations, and ensure transparency.

### Opportunity

**These challenges can be overcome by developing a regulatory framework for carbon markets.** In 2023, the Africa Carbon Markets Initiative (ACMI) partnered with the GoM to launch the Carbon Markets Activation Plan. In September of that year, the Ministry of Land and Environment announced its plan to develop a regulatory framework to support the growth of the carbon market.

An inter-ministerial Task Force on Carbon Markets was established, co-chaired by the Ministry of Economy and Finance and the Ministry of Land and Environment, aiming to draft national carbon market regulation by mid-2024. The Task Force, supported by a consortium of advisors, is organizing Stakeholder Roundtables to further engage sector leads and associations in carbon market development, thus ensuring a participatory approach to developing the framework.

**Formalising the carbon market will attract additional investment and enable other energy access projects to benefit from this source of financing. Keeping up this momentum will require input from stakeholders inside and outside of Mozambique.**





### Context

Since 2020, the GoM has worked hard to **develop and operationalise Mozambique's off-grid regulatory framework**, with strong support from BRILHO and other programs.

This framework, approved between 2021 and 2023, opens the door to private sector participation in the mini-grid market by **tackling critical elements** such as mini-grid concessions, cost-reflective tariffs, and grid interconnection.

**ARENE is launching its first public tender for 71 MGs under the new regulation** – these sites will be privately built and operated.

### Challenge

**While the new off-grid regulation is in place, its operationalisation remains a challenge.** Establishing all processes, document templates, setting up teams and building capacity requires time, financial resources and technical know-how.

The publication of the first mini-grid tender is expected to launch in H2 2024 due to complexities in the operationalisation of the regulation, such as site selection, tariff setting, definition of mini-grid clusters, and the administrative burden of creating new processes and procedures. However, companies can apply for a concession now.

### Opportunity

A lean operationalisation of the new off-grid regulation will expedite the concession process and allow the private sector to function, attract investment, and build mini-grids faster. This could include a fast-track process or unit to support developers going through the concession process for the first time. This approach has accelerated the mini-grid market in other countries in SSA. Both the BRILHO and +SOL programmes will continue and scale its close collaboration with the GoM and private developers, dedicating resources to consolidate the development of Mozambique's mini-grid market.

**BRILHO has already supported operationalisation of regulation and will continue to do so through:**

- ✧ Providing continued support to ARENE to **operationalise** the regulations
- ✧ Supporting the private sector through **RBF and milestone-based grants**, compensating all steps involved in the MG development process: registration, concession process, construction, and connections
- ✧ Launching **behaviour change campaigns** for adoption at new sites
- ✧ Developing a **toolkit** for the Government of Mozambique, to guide through the MG development process
- ✧ Incentivising a **modular MG approach**, welcoming partnerships between MG and SHS companies
- ✧ Continuing to support ARENE with its online platform to automate and expedite the MG concession process
- ✧ Developed an e-book with ARENE to compile all regulations and sub-regulations



## Challenge

- ✈️ **Import duties and VAT remain a major barrier to energy access.** Renewable energy technologies have a 17% VAT and import duties ranging from 7.5% to 20%.
- ✈️ **Only 22% of the off-grid population can afford a non-subsidized SHS** at an average monthly price of USD 7.50<sup>1</sup>.
- ✈️ In 2022, GoM announced an economic acceleration package (PAE) to reduce VAT and temporarily exempt import duties for solar products. However, the PAE did not have an impact on the off-grid energy access sector as it was missing some crucial components of off-grid sector products.

## Opportunity

- ✈️ **Reducing tax and duties and expanding the list of HS codes<sup>1</sup> that are exempt, would allow reduced SHS and ICS prices and lower MG tariffs, providing energy access.**
- ✈️ Reducing the monthly cost below USD 7.50 would allow low-income households to access SHS. Reducing prices to USD 5/month would enable 44% of the off-grid population to afford an SHS. If the price were further reduced to USD 2.50/month, **up to 70% of the population could afford such a system.**<sup>2</sup>
- ✈️ **Fiscal impact:** ensuring the solar sector reaches its full potential will **generate additional tax revenue** that will more than compensate for the annual VAT and import duty revenue loss at the current market size. A positive net **annual tax revenue of USD 9.25 million could be achieved through** corporate taxes on profits, and income taxes on employees in the solar value chain.<sup>3</sup>
- ✈️ **Economic impact:** VAT and import duty exemptions could help create jobs in the value chain (1,390 jobs direct contribution)<sup>3</sup>

1. Harmonized System (HS) codes are numerical codes used to classify products for international trade  
2. USAID Power Africa (2020), Can Mozambican households afford SHS? Insights from a local survey  
3. GOGLA SADC Tax Harmonisation (2021)



Photo credit: BRILHO/SNV



# Part 3

# The Road to 2030



**While this report showcases BRILHO**, increasing energy access in Mozambique has been a collaborative effort across actors. Moving forward, these parties must deepen their respective and collective efforts, including some of the following measures.

## Government of Mozambique

The Government of Mozambique has demonstrated its commitment to providing energy access for all. Its recent efforts include:

- ✈ Promulgating an investment-friendly regulatory framework for the off-grid energy market.
- ✈ Providing strategic leadership, including the development of the Energy Transition Strategy and the Electricity Law.

**To achieve universal access, the Government should consider the following measures:**

- ✈ Lead the operationalisation of pivotal new regulations, including those governing the electricity sector and carbon markets; both will unlock a new wave of energy access impact across the country.
- ✈ Incentivise the private sector to deepen its investment and operational role in supporting Mozambique's energy access goals.
- ✈ Provide tax exemptions and fiscal incentives.
- ✈ Find practical ways to operationalise the off-grid regulatory framework.
- ✈ Develop carbon market regulations that brings clarity and incentivise the participation of the private sector.





## Development partners

Development partners and their programs have been instrumental in catalysing Mozambique's energy sector:

- ✈ Providing incentives to the private sector to expand activities into/within Mozambique
- ✈ Supporting the Government to develop a regulatory framework that balances public and private sector roles and responsibilities

**To deepen their impact in Mozambique, development partners should:**

- ✈ Better align their efforts to ensure interventions are coherent and complement one another
- ✈ Rethink success metrics to prioritise long-term, sustainable solutions over short-term gains
- ✈ Continue providing practical support to operationalise the off-grid regulatory framework
- ✈ Continue efforts in mobilising other types of financial solutions that could attract more private investment

## Private Sector

The private sector has championed the implementation of energy access programs through innovative technologies and business models, and by creating the operational structures to deliver and service customers in the most remote regions of Mozambique. To further succeed the private sector should consider:

- ✈ Continue innovating services, products, and processes to enhance and strengthen business models.
- ✈ Invest in professionalising credit management as a core component of the PAYGo model.
- ✈ Collaborate more closely with communities to raise awareness, create demand, and provide training on the products offered.
- ✈ Accelerate PUE and other product lines (e-mobility, solar irrigation, healthcare, telecom), which have many income-generating and socioeconomic benefits. This can be supported by leveraging existing financing mechanisms available from development partners.





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