

Transforming the care economy through impact investing case study:

# Emerging Cooking Solutions



The Care Economy  
Knowledge Hub

[the-care-economy-knowledge-hub.org](https://the-care-economy-knowledge-hub.org)

# CONTENTS

FOREWORD	2
INTRODUCTION	4
<b>1 - EXECUTIVE SUMMARY</b>	<b>6</b>
<b>2 - ECOSYSTEM</b>	<b>8</b>
2.1 Zambia: statistical snapshot	8
2.2 Context analysis	9
<b>3 - BUSINESS DEEP DIVE</b>	<b>13</b>
3.1 Business headline	13
3.2 Founder story	16
3.3 Business model	18
3.4 Emerging Cooking Solutions's growth story	19
3.5 People and governance	20
3.6 Support received to date	21
3.7 Key business drivers and challenges to growth	22
<b>4 - IMPACT DEEP DIVE</b>	<b>26</b>
4.1 The impact theory of change of the enterprise	26
4.2 Current impact and measurement practices	28
4.3 Customers' own experiences of the solution	30
<b>5 - LOOK FORWARD</b>	<b>45</b>
5.1 Growth and sustainability plans	45
5.2 Ask of investors and stakeholders	46
5.3 Lessons learned	47
5.4 Recommendations for policymakers, investors, and entrepreneurs	48
ENDNOTES	50

## FOREWORD

Vital for our society to function, the care economy – domestic work and caring for children, elderly people, and people with disabilities – as it is now, operates as one of the most pervasive structural barriers to women’s economic autonomy and gender equality.

Across the world care work is mostly done by women and girls, who perform 3-quarters of unpaid care work. Representing more than 11 percent of total global employment, paid care work is also a significant source of employment, particularly for women. However, these jobs are poorly paid, in positions that fall outside of formal employment structures, and insecure due to ingrained gender and racial biases and the work’s perceived value. The precariousness of paid care work and the unequal distribution of unpaid care work restricts women’s time and mobility, as well as their equal participation in social, economic, and political life. And this dynamic is unlikely to change without collective action. The climate crisis is increasing the demand for care and domestic work globally, while the COVID-19 pandemic generated a [care crisis](#) that exacerbated pre-existing gender inequalities.

Both formal structures and informal structures (norms) hold care economy inequalities in place. Gendered norms also shape national policies on how care work is recognized and valued, and how the responsibilities between families, governments, and the private sector are distributed.

While public investment and policies must be at the core of the solution, a renewed role for the private sector is crucial. Announced as a [commitment at the Generation Equality Forum](#), in 2021 Canada’s International Development Research Centre (IDRC) and the Open Society Foundation’s impact investment arm, the Soros Economic Development Fund (SEDF), launched an [action-oriented research initiative to help Transform the Care Economy through Impact Investing](#) (TCEII). Through this partnership, IDRC continues to build on its commitment to transform the care economy and mobilize finance for gender equality.



Erin Tansey



Catherine Cax

Since its launch, a global consortium of partners has built an [extensive knowledge and evidence base](#) to mobilize capital and impact investment to address the care economy's challenges in emerging markets. The program is now launching a collection of 20 case studies on care economy social innovations and impactful businesses, which complements 59 business profiles and mapping of 165 market-based solutions operating in emerging markets in Latin America, Africa, and Asia. The [TCEI program](#) also involves care-economy businesses incubation and acceleration, research on regulatory frameworks and policies, awareness raising, and industry policy dialogues.

As we witness growing momentum and understanding of the urgency of addressing the care crisis, we hope these case studies on pioneering companies will help advance concrete strategies to move from awareness to action. These case studies help to demonstrate viable and impactful business models, ranging from building social security infrastructure to labor-saving products and services. They offer a unique and nuanced understanding of the businesses' theories of change and impact journeys. The case studies also help to share the lessons these innovators have learned on their pathways to scale, and it is our hope that they will attract more capital into the care economy for deepened impact.

We invite you to read this collection of case studies and engage with them, and the other resources and tools developed by the TCEI program, to mobilize investment into the care economy.

Together we can advance [towards a care society](#) where social innovation, entrepreneurship, and investment can be part of the solution for economic justice globally.



**Erin Tansey**

Sustainable and Inclusive Economies  
Director  
International Development Research  
Council



**Catherine Cax**

Managing Director, Investments  
Soros Economic Development Fund

## INTRODUCTION

The care economy consists of paid and unpaid labor and services that support caregiving in all its forms. In Africa, Asia and Latin America, women spend between 3 to 5 times as many hours on unpaid care and domestic work as men. This represents 80 percent of a household's total hours devoted to unpaid care work.

Care economy enterprises can help recognize, redistribute, reduce and reward – also known as the 4 Rs – unpaid and paid care and domestic work in the following ways:



**Recognize:** Initiatives that increase visibility and recognition of paid and unpaid care and domestic activity as "productive" work that creates real value and contributes to economies and societies.



**Redistribute:** Services and initiatives that redistribute care work from individuals to public and private sector entities, and redistribute care and domestic work within the household.



**Reduce:** Products and initiatives that reduce the time spent on and burden of unpaid care and domestic work.



**Reward:** Products, services, and initiatives that ensure that care and domestic workers are paid fairly and have professional growth potential. This provides them with financial reward and security.

The Care Economy Knowledge Hub – the research pillar of the Transforming the Care Economy Through Impact Investing Program – aims to address the knowledge gap around care businesses by showcasing various business models and creating a resource base for relevant stakeholders. It also aims to raise awareness and increase knowledge of the state of impact-driven care economy business models and attract a broad range of funders to invest in care economy solutions by showcasing opportunities.

A curated set of 20 business case studies, of which this case study is one, has been researched and written between October 2021 and January 2024. The case study businesses were selected out of a set of 165 businesses that were mapped between October 2021 and August 2022, and then a further 59 that were profiled between September 2022 and May 2023. They present a wide variety of different ways in which care work can be recognized, rewarded, reduced, and redistributed, from different sectors and different geographies, from different stages of the growth journey and different business models, from different products and services and different impact pathways. Each case study was

written based on extensive desk-based research, including a literature review; a review of key business documents; a series of deep conversations with founders, CEOs, and key staff; and impact-focused qualitative research with 8 - 15 consumers of business products and services.

Each case study starts with a 1-page executive summary that provides “at a glance” information on the business and Section 1 provides an introduction. Section 2 describes the ecosystem within which the business operates. The business deep dive can be found in Section 3. Section 4 presents an impact deep-dive, including customers’ own experiences of the care economy solution, and a unique set of qualitative impact data. Section 5 outlines the business’s future plans in their look forward.

Shifting attention towards and investment in the care economy is one of the single most important actions that policy makers, investors, and community leaders can take to achieve gender, racial, and climate justice. We hope that these case studies contribute to the much-needed transformation in our economic and social systems.

**Rebecca Calder**

Principal Investigator, Transforming the Care Economy Through Impact Investing  
Co-Founder and Co-CEO, Kore Global

---

*This project is supported by Canada's International Development Research Center, in partnership with the Soros Economic Development Fund at the Open Society Foundations. Building on their track record and commitment to transforming the care economy and mobilizing finance for gender equality, they are jointly supporting this action research program to help transform the care economy through impact focused business and investment. This case study is a joint research product, developed by a consortium led by Kore Global, including Intellectap, Core Woman, Busara, Sagana, and Volta Capital. Copy editing and graphic design were done by Big Blue Communications.*

**This particular case study should be cited as follows:**

Intellectap, Busara Center for Behavioral Economics, Kore Global. (2024). *Transforming the care economy through impact investing: Emerging Cooking Solutions case study*. Kore Global, International Development Research Centre, and Soros Economic Development Fund

## 1 - EXECUTIVE SUMMARY

Emerging Cooking Solutions Zambia is a for-profit company that distributes imported Tier-4<sup>1</sup> clean cookstoves (branded MimiMoto®)<sup>2</sup> and biomass-based cooking fuel (pellets branded SupaMoto®) to low-income families in Zambia. The enterprise has also designed its own Tier-5<sup>3</sup> cookstove (branded SupaMoto®)<sup>4</sup> and expects to start distribution by the end of 2023. In addition to Zambia, Emerging Cooking Solutions (ECS) also has operations in Malawi and Mozambique. The company's products play a critical role in reducing the burden of unpaid care work by helping women and girls spend less time on domestic care activities such as sourcing firewood for cooking and heating. These products also reduce indoor air pollution and lower the cost of cooking compared to traditional cooking methods (which use charcoal and firewood). For every household that switches from charcoal to biomass pellets<sup>5</sup>, 3-4 tons of carbon emissions are reduced annually. To date, the enterprise has served 22,732 customers. In 2021, the enterprise had a revenue of US\$1,036,060. Emerging Cooking Solutions has 92 full-time employees. The enterprise is looking to raise US\$2 million in equity or quasi-equity.



### Emerging Cooking Solutions at a glance

Established	2012
Country of operations	Zambia, Malawi, Mozambique
Offerings	Provides clean cooking products and services, doorstep delivery, after-sales service.
Reach	22,732 customers
Staff	92 full-time employees
Revenue	US\$1,036,060 (2021)
Investment to date	US\$3,530,000 in grants

Leadership	<a href="#">Mattias Ohlson</a> , CEO <a href="#">Marion Peterson</a> , COO
Contact for partnerships	<a href="mailto:mattias@supamoto.co.zm">mattias@supamoto.co.zm</a>
Website	<a href="http://www.emerging.se">www.emerging.se</a>

## 2 - ECOSYSTEM

### 2.1 Zambia: statistical snapshot

 <p>Demographic information</p>	<p><b>Total population</b> (<a href="#">Zambia Statistics Agency</a>, 2022): 19 million</p> <p><b>Female population</b> (<a href="#">Zambia Statistics Agency</a>, 2022): 10 million</p> <p><b>Urban &amp; rural population</b> (<a href="#">World Bank</a>, 2021): Urban (55%)   Rural (45%)</p> <p><b>Population in different age segments</b> (% of total population) (<a href="#">World Bank</a>, 2021):</p> <ul style="list-style-type: none"> <li>• 0–14 years: (43%)</li> <li>• 15–64 years: (55%)</li> <li>• 65 and above: (2%)</li> </ul>
 <p>Unpaid care work</p>	<p><b>Proportion of daily time spent on unpaid domestic care work</b> (<a href="#">FAO</a>, 2018)</p> <ul style="list-style-type: none"> <li>• In Zambia, women spend about 4–6 hours cooking and 2.3 hours collecting firewood every day. In a year, while women spend more than 800 hours collecting fuelwood, men spend less than 50 hours, and that too mostly for commercial purposes.</li> </ul>
 <p>Social &amp; economic</p>	<p><b>Literacy level</b> (<a href="#">Global Gender Gap Report</a>, 2021)</p> <ul style="list-style-type: none"> <li>• Females (83.1%)   Males (90.6%)</li> </ul> <p><b>Poverty</b> (<a href="#">Habitat for Humanity</a>, 2018)</p> <ul style="list-style-type: none"> <li>• 64% of the total population live in poverty (less than US\$1.9/day) and over 40% live in extreme poverty; as against the global poverty rate of 8.9%.</li> </ul> <p><b>Urban &amp; Rural Poverty</b> (<a href="#">SIDA</a>, 2018)</p> <ul style="list-style-type: none"> <li>• Rural (76.6%)   Urban (23.4%)</li> </ul> <p><b>Formal &amp; informal employment</b> (<a href="#">Zambia Statistics Agency</a>, 2020)</p> <ul style="list-style-type: none"> <li>• Total number of people employed in: Formal 26.2%   Informal 73.8%</li> <li>• Females employed in: Formal 32.2%   Informal 42.5%</li> <li>• Males employed in: Formal 67.8%   Informal 57.5%</li> </ul> <p><b>Gender-based violence</b> (<a href="#">Zambia Demographic and Health Survey 2018</a>, 2018)</p> <ul style="list-style-type: none"> <li>• 42.2% of women aged 15–49 years have faced intimate partner physical and/or sexual violence at least once in their lifetime.</li> <li>• 25.3% of ever-partnered women aged 15–49 years have reported facing intimate partner physical and/or sexual violence in the last 12 months.</li> </ul>



Women's work,  
labor, and  
entrepreneurship

**Labor force participation** ([Global Gender Gap Report](#), 2021)

- Female (71.3%) | Male (79.1%)

**Unemployment** ([CEIC](#), 2021)

- Total unemployment rate: (12.50%)

**Unemployment (% of total labor force)** ([Global Gender Gap Report](#), 2021)

- Female (13.77%) | Male (11.16%)

**Women-owned businesses**

- Share of women entrepreneurs in Zambia ([ILO](#), 2015), Female: 51%.
- Share of women-owned businesses ([World Bank](#), 2021) Micro-enterprises: (42%) | SMEs (36%)
- Share of female entrepreneurs in Zambia ([ILO](#), 2015): Urban: 54%| Rural: 50%
- Firms with female majority ownership, % firms ([Global Gender Gap Report](#), 2021): 41.50%
- Firms with female top managers, % firms ([Global Gender Gap Report](#), 2021): 12.90%

**Gender pay gap** ([Mywage](#), 2021).

- The gender pay gap in the country varies from 10% to 40%.

**Global Gender Gap Index score** ([Global Gender Gap Report](#), 2021):

- Total: 0.726 (0=unequal, 1=equal)

**Financial inclusion** ([Finscope](#), 2020)

- 67.9% of women have bank accounts.

## 2.2 Context analysis

### Macro context in Zambia

Zambia's population, estimated to be about 19 million, is rapidly growing at a rate of 2.7% per year.<sup>6</sup> Forty-five percent of the Zambian population lives in urban areas and the country has a high rate of annual urbanization growth (4.23%) in Africa.<sup>7</sup> Located in the Copperbelt of Africa, Zambia has a GDP of USD 22.15 billion<sup>8</sup> (ranked 20th in Africa with a 0.833% share in Africa's GDP).<sup>9</sup> The industrial sector, driven by mining, construction, and manufacturing activities, plays a significant role in the economy and contributes 42.5% to GDP.<sup>10</sup>

The country faces a critical energy crisis that is distinctively embedded in inequality. While privately owned copper mines consume more than half of the electrical power generated domestically, only 22% of households have access to the national grid.<sup>11</sup> In the absence of

electricity, the limited availability of gas, and increasingly expensive generators, many households depend on torches or candles for lighting and use firewood or charcoal in traditional and inefficient stoves (Mbaula) for cooking, thereby accelerating the rate of deforestation in the country.<sup>12</sup> Notably, Zambia has one of the highest rates of deforestation in the world, at 250,000–300,000 hectares per annum.<sup>13</sup>

The adverse impact of energy poverty in Zambia is also reflected in the country's socioeconomic development indicators. Over 60% of the population lives below the poverty line. As of 2018, close to 64% of Zambians were living on less than US\$2 a day, and over 40% were living in extreme poverty (less than US\$1.25 a day).<sup>14</sup> Only 33% of the Zambian population has access to basic sanitation services and 24% to basic hygiene services, i.e. handwashing facilities with soap and water.<sup>15</sup> Lack of access to adequate water, sanitation, and hygiene facilities has resulted in a high incidence of morbidity. Moreover, poor sanitation is one of the leading causes for the high rate of child stunting in the country, which stands at 35%.<sup>16</sup>

### Care economy context:

In Zambia, more than 75% of the population is dependent on solid fuels<sup>17</sup> for cooking.<sup>18</sup> Research also shows that 90% of households rely on wood to meet their energy needs,<sup>19</sup> while 60% of peri-urban households completely rely on charcoal for their energy requirements.<sup>20</sup> <sup>21</sup> Sourcing firewood and charcoal for cooking is largely done by women and girls and is a time-consuming activity. It not only reduces the time available to women and girls for other activities but also affects their quality of life. Observational and time-use/ diaries-based studies in Africa show that women in Sub-Saharan Africa spend nearly 12 hours per week collecting firewood. In urban areas, the time spent by women in cooking ranges from 0.8 to 1.3 hours each day.<sup>22</sup> In Zambia, on average women spend 2.3 hours collecting firewood and 4 to 6 hours on cooking each day.<sup>23</sup>

Furthermore, while women spend more than 800 hours every year collecting fuelwood for cooking and other domestic use, men spend less than 50 hours and mainly collect firewood for commercial purposes.<sup>24</sup> It has also been observed that lack of access to clean cooking solutions impacts other areas of women's empowerment. A regional analysis has found a positive correlation between the introduction of efficient cooking stoves and female workforce participation in the longer term.<sup>25</sup>

Multiple studies have shown that unclean cooking has a wide-ranging impact on quality of life. The use of unclean fuels (such as charcoal) contributes to nearly 25% of the world's black carbon emissions. Black carbon has a warming capacity of nearly 500–1,500 times higher than CO<sub>2</sub>.<sup>26</sup> Moreover, unclean cooking fuels are also the most significant cause of indoor air pollution. According to the

World Health Organization, in 2020 exposure to indoor air pollutants caused nearly 3.2 million deaths worldwide.<sup>27</sup> Of these, 34% were in Sub-Saharan Africa, with women aged between 15 to 49 and children less than 5 years of age making up over one third.<sup>28</sup> In Zambia, over 8,000 people died due to household air pollution from solid fuels in 2019.<sup>29</sup> The most significant way to prevent such deaths is for households to transition from traditional methods of cooking to cleaner ways of cooking. However, the high upfront costs of clean cooking solutions, as well as lack of access to debt financing, exclude low- and middle-income households that do not have the financial means to purchase clean cookstoves in 1 large payment.

### Market opportunity

The supply of modern and eco-friendly energy sources has not kept up with the demand for cooking and heating fuels in Zambia. Currently, only 16% of the population has access to clean cooking solutions. Over 60.7% of urban households use a traditional charcoal stove as their primary cooking solution, and 32.5% households use electric stoves as their primary means of cooking in urban areas.<sup>30</sup> In rural regions of the country, about 83.6% of households use open fires.<sup>17</sup> The existence of a large segment of consumers who currently use firewood and charcoal creates a potential market for clean cookstoves and bio-pellets that offer distinct advantages in terms of cost, time, ease of use, etc.

The inadequate availability of affordable alternative cooking fuels has led to the demand for fuelwood surpassing supply and resulted in fast-depleting Zambian forestlands. This, in turn, has led to adverse climatic effects, rising cooking fuel prices, and increased morbidity and deaths from indoor air pollution. The market opportunity for improved cooking solutions (using bio-pellets etc.) is therefore ripe, considering the economic, environmental and policy landscape of the country. Correspondingly, the clean cooking sector in Zambia is witnessing a huge inflow of investments. For instance, in March 2023, the European Union announced a contribution of €12.5 million to the Modern Cooking Facility for Africa program, with the aim of supporting market development for clean cooking in Zambia over 5 years. Moreover, Spark+Africa, an impact investment firm, has committed US\$3.5 million to finance the distribution of improved cookstoves in rural Zambia.<sup>31</sup>

Zambia's current development priorities including its goal of universal access to modern and clean energy, especially cooking fuels, and its corresponding target of reducing the share of fuelwood to less than 40% of total cooking fuels by 2030 are aligned with the need for investments in biomass pelleting and briquetting—activities that are mainly suited to small and medium enterprises (SMEs). Zambia's revised National Energy Policy (2019) also provides an enabling framework to stimulate the growth of the clean cooking sector. This involves the use of innovative financing mechanisms and instruments to promote the use of biofuels.

In the last 2 years, advocacy efforts by international stakeholders such as the World Bank, USAID, Swedish International Development Agency, and Nefco, as well as private sector participation has renewed the focus on the clean cooking agenda in Zambia, leading to the re-establishment of the Energy Sector Advisory Group (under the Ministry of Energy) in 2021. Programmatic interventions such as Modernizing Cooking and Heating (World Bank), Alternatives to Charcoal (USAID), and Beyond the Grid Fund Zambia (SNV

Netherlands Development Organisation) have played a catalytic role in accelerating the transformation of the clean cooking sector by supporting regulatory policy frameworks, providing market solutions (financing, technical assistance, data), and undertaking social behavioral change and communication activities to promote the use of clean cooking solutions. Efforts by the government as well as non-governmental actors that highlight the harmful effects of charcoal have also helped promote alternative methods of cooking.

## 3 - BUSINESS DEEP DIVE

### 3.1 Business headline

Emerging Cooking Solutions (ECS) is a for-profit enterprise that provides clean cooking fuel in the form of biomass pellets along with imported Tier-4<sup>32</sup> clean cookstoves to urban and peri-urban households in Zambia, reducing the time women and girls spend sourcing cooking fuel and cooking. Previously, the business sold cookstoves and pellets to its customers. However, it has been phasing out this model and phasing in a new subscription service since 2022. Under the new subscription model, the enterprise rents out imported clean cookstoves (MimiMoto stoves) to households.<sup>33</sup> As part of the subscription contract, households must purchase biomass pellets to use the cookstove every month. Households pay an upfront membership fee of US\$6.80 (ZMW 114.92) for the stove and a subscription fee of US\$7.30 (ZMW 123.37) per month for 30kg of pellets.<sup>34</sup> ECS also offers value-added services such as door-step delivery of bio-pellets (free of charge), a 3-year warranty, and free repairs of the cookstoves in case of any damage. It provides customers with training and customer care services to ensure continued operation and correct use of the stove. Customer care support is provided through a call center and is available in 9 local languages.

ECS's value proposition is that it enables cost and time savings by providing affordable clean cooking fuel that reduces the time taken to prepare meals. Research conducted by the enterprise shows that purchasing 30 kilograms of pellets each month is 33% cheaper than purchasing charcoal for cooking purposes. Its offering also reduces indoor air pollution and the harmful impact of cooking with charcoal fires, as ECS cookstoves burn efficiently.

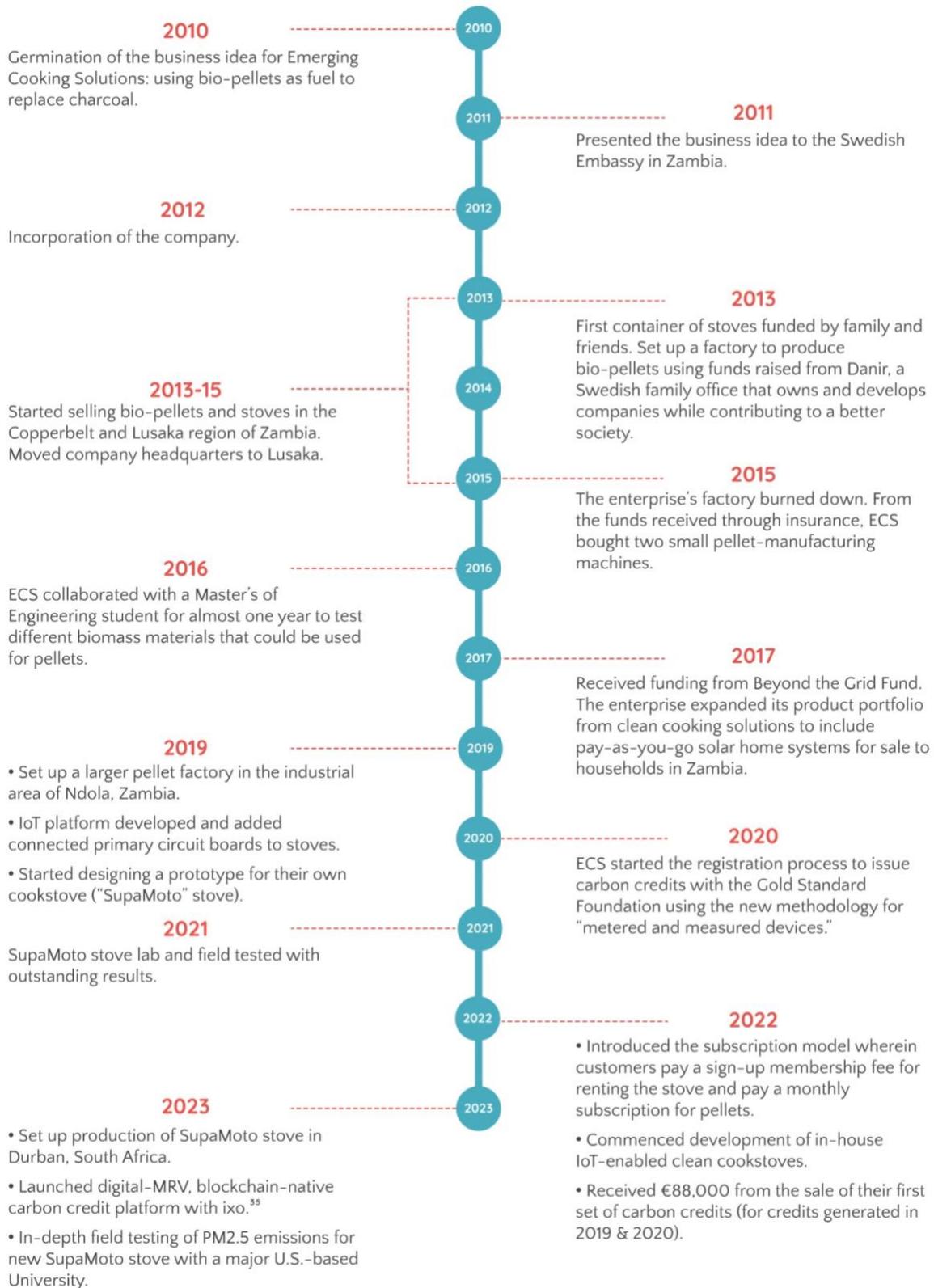
The business also offers several services that enable ease of use. Users pay a 1-time membership fee, which enables them to buy pellets and rent the stove. Thereafter, users can buy pellets on a monthly or bi-weekly basis. The enterprise has developed its own server-side software, firmware that controls the MimiMoto stove's electronic board, and a protocol that enables communication between the stove and the enterprise's servers. This provides the enterprise with real-time information about how the stoves are being used. It also allows the enterprise to disable cookstoves for households that stop availing the pellet subscription service. Each customer's phone number is linked to their stove, and customers pay for the pellets through mobile money. This allows the business to track pellet purchases associated with each stove.

What sets ECS apart from competitors is that it is one of the first businesses in the clean cooking solutions space that prioritizes the provision of clean fuel over selling more efficient cooking equipment. The enterprise believes that it is more important to enable the switch to a cleaner fuel than to push cookstoves that provide some energy savings, given charcoal's use as fuel has a massive impact on deforestation and human health. Moreover, ECS has

developed a fuel by using materials that are readily available in Zambia. This ensures that the pellets are affordable, and prices are not adversely impacted by currency fluctuations and global supply chain disruptions. The company is also in the final stages of launching its own cookstove, designed to serve the full spectrum of customers' cooking requirements. These stoves are also IoT-enabled (Internet of Things) and will allow the enterprise to track their performance as well as allow it to continue tracking fuel purchase and claim carbon credits.

ECS's core focus is on replacing charcoal as a fuel for cooking. A total of 54% of ECS's customers are women. Moreover, over 24% of its workforce consists of women. ECS has already sold over 3 million kilograms of pellets in Zambia, and almost 3,000 customers use its subscription model. The enterprise is looking to raise US\$2 million in equity or quasi-equity investments to meet its working capital needs.

## Emerging Cooking Solutions' journey<sup>35</sup>



## 3.2 Founder story



Mattias Ohlson and Marion Peterson are the co-founders of Emerging Cooking Solutions. Mattias is the CEO of the Emerging Cooking Solutions Group, and Marion is the COO of Emerging Cooking Solutions Zambia. While Mattias is responsible for developing the firm's overall strategy, Marion leads the marketing, research, and community development activities in Zambia.

Mattias studied chemistry with a full scholarship at Harvard University. He has worked with Doctors Without Borders in Afghanistan as well as headed its program in Sweden. In 2009, he founded Vagga till Vagga AB, a firm that provided consulting services for environmental work. Mattias was always interested in the idea of a no-waste economy, especially the process of carbon sequestration, which eventually led him to the idea of developing cooking solutions that would replace charcoal and wood as cooking fuels.

Marion studied architecture at the National School of Architecture of Paris-La Villette. She worked in design and architecture and eventually founded a company that provided French-to-English translation services in Paris. During this time, Marion became closely involved with a consulting team advising companies on developing solutions and products that aligned with the 'cradle to cradle' philosophy. This school of thought, often also referenced as a circular economy, envisages a no-waste society. It was through her work with these companies that Marion started working with Mattias to develop no-waste solutions.

In 2011, the Swedish Embassy in Zambia invited the duo to present their idea of using pellets for cooking. On their visit to Zambia, Marion and Mattias visited the Copperbelt, which were severely polluted. The plight of communities living in these belts, as well as Zambia's interest in their solution, spurred Marion and Mattias to set up Emerging Cooking Solutions in Zambia in 2012 together with a third co-founder Per Lofberg.<sup>36</sup> ECS aimed to provide affordable, micro-gasifying clean cooking stoves and pelletized waste biomass, producing biochar available to low- and middle-income groups in developing countries.

Marion and Mattias bring complementary skills to the business. While Mattias has a keen instinct for developing ideas and strategies, Marion has the ability to connect with people, which has helped her build a deep understanding of ECS's consumer segment.

The enterprise was initially bootstrapped and mainly received funds from family and friends to buy the first container of stoves. In 2013, ECS received an investment from a Swedish family office, DANIR, which enabled them to set up a factory for producing bio-pellets. The factory was strategically located in proximity to a company that processed pine from nearby plantations. Emerging Cooking Solutions used the waste generated by this factory to manufacture the pellets.

Initially, the enterprise acquired customers by marketing to employees in other companies. These employees could purchase the clean cookstove, and a monthly payment was deducted from their salaries. However, the founding team soon realized that many such users had other cooking devices available such as electric stoves, gas stoves, etc., and in many cases the stove provided by ECS was used only occasionally. Emerging Cooking Solutions considered this 'a waste of a good stove' because it was not furthering their mission of replacing charcoal, even if the stoves were being sold for a profit.



*In our thinking, we are a fuel company, we are not a stove company. We want to sell the fuel and the benefit has to come from the fuel. So if we sell the stove, even with the benefit of profit, we're not, making an impact if it's not used. It's a waste of a good stove. That's the way we think. Now, of course you could think, Oh, well, why don't you sell **loads of stoves**, at least that gives you money in. But we're kind of a mission-based company. We have this idea of creating impact behind us.*

**Marion Peterson, Co-founder of Emerging Cooking Solutions**



---

ECS eventually expanded its operations from the Copperbelt region of Zambia to Lusaka. The enterprise sold its stoves through a pay-as-you-go model. However, the enterprise faced challenges in receiving payments from households. Thus, in 2022, ECS pivoted to a subscription model, wherein users opt for a fixed monthly paid subscription of bio-pellets

(approximately 1 kilogram a day) and rent stoves in order to use these pellets. This allows the business to maintain ownership over the stoves, which can be recovered if users stop subscribing to bio-pellets. Moreover, the enterprise is able to recover the cost of the stove in 18 to 24 months' time through the revenue generated from the sale of pellets, and carbon credits. For customer acquisition, the enterprise appoints and leverages the social network of a 'lead generator' among the community, typically a well-known leader from a church, school etc. to drive sales through network marketing. The enterprise aims to create strong relationships with communities by undertaking customer visits as well as calls.

Over the last decade, ECS has also developed a better understanding of its customers and the local needs of the community. As a result, its messaging for adoption of clean cooking fuel has undergone a change. Initially, it focused on the need to shift from charcoal to biopellets in order to prevent environmental degradation. However, advocating for the use of clean cooking equipment and fuel to address health implications from using charcoal as well as highlighting money and time saved resonated more with the community and created a demand for the enterprise's products. Thus, the enterprise currently focuses on highlighting the time and cost savings as well as the health benefits of using its pellets. Presently, the enterprise has focused its efforts on expanding its subscription customers, moving existing customers to the subscription model and developing an in-house prototype for enhanced stoves.

### 3.3 Business model

 <b>Customer segment</b>	<p>ECS targets low-income (earning less than US\$56 per month) and middle-income (earning between US\$56-\$169) urban and peri-urban households in Zambia. It provides an affordable clean cooking fuel in the form of bio-pellets as well as cookstoves that reduce the time spent on cooking, and sourcing fuel. The enterprise also provides biomass pellets at a 20% discount to local entrepreneurs, who, in turn, sell them to households in their vicinity.</p>
 <b>Value proposition</b>	<p>ECS provides stoves and pellets that are suitable for a range of cooking needs (both in terms of heat intensity and duration). ECS's solutions are affordable. As the stoves are rented, customers do not have to make a large upfront payment to purchase a clean cookstove. Moreover, the pellets are 33% cheaper than charcoal. They are also readily available in neighborhoods and can also be conveniently obtained via home delivery through use of mobile money payment options.</p>
 <b>Competitive advantage</b>	<p>The enterprise prioritizes the sale of clean fuel (pellets) over selling more efficient cooking equipment. The pellets can produce a kWh of useful cooking energy at a minimal cost, providing ECS high enough margins on the fuel to cover all operating expenses and be profitable (at scale) with fuel sales alone.</p>

 <p>Channels &amp; key partnerships</p>	<p>ECS distributes MimiMoto stoves that are imported from a supplier in the Netherlands, and manufactured in Shenzhen, China. It has also developed its own stove, SupaMoto, which comes with performance improvement measures such as using 30% less fuel and additional control over cooking temperatures. It has trained its sales staff to engage with communities to acquire customers. Sales staff identify 'lead generators' to gain access to their social networks for their marketing efforts.</p> <p>ECS Zambia has employees and a network of partners that work directly with large plantation operator, ZAFFICO, as well as dozens of sawmillers to procure various residues (branches, offcuts and sawdust) as feedstock for pellet production.</p>
 <p>Customer relationship</p>	<p>ECS provides customers with ongoing training, maintenance, and services to ensure continued operation and correct use of the stove. A local field customer relationship officer is responsible for the initial delivery of products to new customers and caters to any repair or maintenance services.</p>
 <p>Revenue streams</p>	<p>60% of ECS's revenues come from membership fees and the sale of cookstoves and pellets; 40% of the enterprise's revenue is from grants. The enterprise received €88,000 from the sale of carbon credits in 2022 (for credits generated in 2019 &amp; 2020).</p>
 <p>Cost structure</p>	<p>26% of ECS's total expenditure is on cost of goods sold i.e. on items required to purchase and manufacture its products, whereas 26% is on personnel. The remaining 48% is spent on transportation, distribution, maintenance of vehicles and stores, communications as well as other costs.</p>

### 3.4 Emerging Cooking Solutions's growth story

Although the enterprise has demonstrated overall growth since its inception, it faced a gradual decline in revenue amidst the pandemic. During the COVID-19 lockdown, the enterprise had limited access to customers and could not conduct community visits for promotional activities for its products. Furthermore, disruptions in supply chain and logistics affected the sourcing of raw materials and components. For instance, the supply of batteries (for the stove) from China was suspended, and it eventually took a year and a half for the batteries to reach the enterprise after being redirected through Congo. Supply chain restrictions also led to an increase in the prices of raw materials. Together, these events adversely impacted the enterprise's operations.

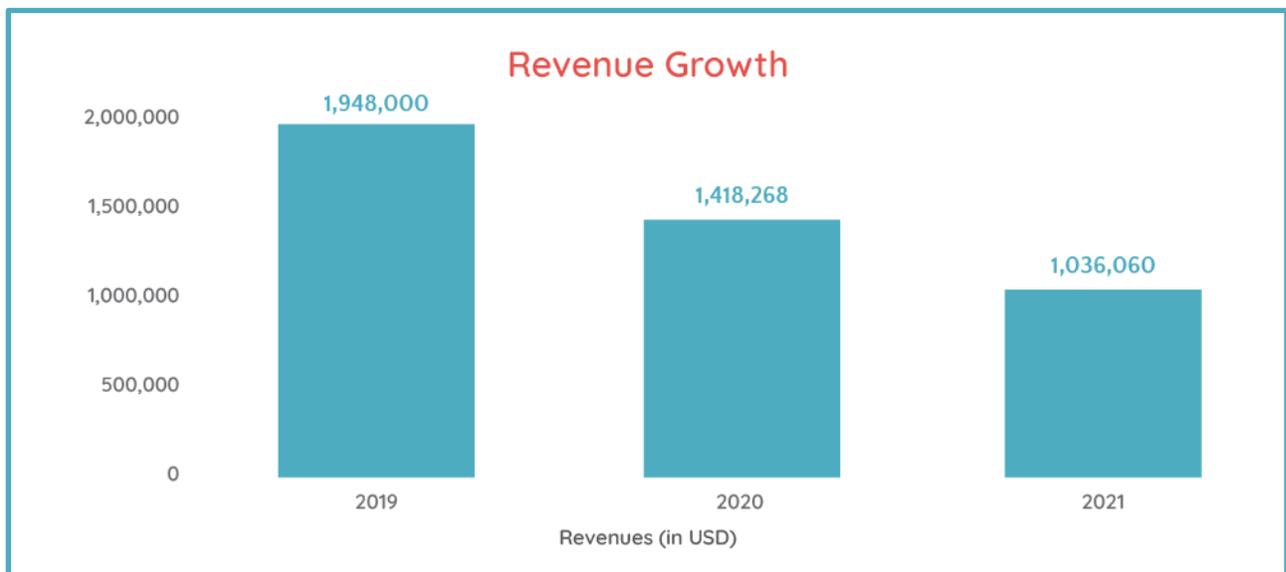
#### 3.4.1 Product sales:

ECS commenced operations with the sale of clean cookstoves and the sale of pellets. In 2017, ECS received a grant from the Beyond the Grid Fund, which provides results-based financing to companies offering solar home light systems in Zambia. ECS integrated solar lights into its portfolio of products. The enterprise introduced the pay-as-you-go payment

system that removed the upfront price barrier of Solar Home Systems (SHS) by allowing end users to pay in affordable amounts over time. This helped the enterprise expand its customer base across Zambia. However, ECS faced challenges, as many users either delayed the payments for several years or refused to pay it all. Therefore, ECS halted the distribution of pay-as-you-go solar home light systems. In 2022, ECS launched the pellet subscription model and has been moving existing customers to this model.

### 3.4.2 Revenue growth:

Reflecting a decline in the number of customers, as well as a transitioning out of solar home systems (low-margin product) into only clean cooking (higher margin), ECS revenue too has shown a gradual decline since 2019.



### 3.5 People and governance

Emerging Cooking Solutions is committed to gender and climate justice and strives to achieve this not only through its product offerings but also through its people and governance structure, practices, and policies.

2X Criteria <sup>37</sup>	Climate and Gender Justice <sup>38</sup>
<ul style="list-style-type: none"> <li>• 1 of the 3 founders is a woman.</li> <li>• 40% of senior leadership are women.</li> <li>• 20% of the Board of Directors are women.</li> </ul>	<ul style="list-style-type: none"> <li>• To a large extent, the company supports local economic regeneration and just transition, reducing the health impacts from environmental pollution and the care workload on women in vulnerable communities.</li> </ul>

- 24% of full-time employees are female.
- Products and services are largely for women.

- To a large extent, the company provides affordable clean energy and fuel solutions to low-income households (urban or rural), which improves women's health outcomes and economic participation.
- To a large extent, the company has improved access to affordable and reliable clean energy, which has reduced women's care responsibilities and freed up time for leisure, education, and economic activities.

Emerging Cooking Solutions is a **gender-intentional** business.<sup>39</sup>

Emerging Cooking Solutions is a **gender-transformative** business.<sup>40</sup>

In Zambia, the enterprise has 92 full-time employees, 24% of whom are women. The full-time employees include the CEO, COO, Operations Senior Manager, Sales and Aftersales Manager, Senior Production Manager, Fintech Manager, and Senior Accountant. Other members of the team work in the pellet factory, with sales or after-sales, distribution, or administration. The enterprise has a management board of 5 members, 20% of whom are women. The enterprise has adopted a non-discrimination policy and provides equal pay for equal work. It also has policies on sexual harassment, employee grievances, and policies that reduce its environmental impact.

Over the years, Emerging Cooking Solutions has evolved its hiring strategy to meet its growing requirements while considering the availability of talent. During its initial years, resourcing of suitably skilled personnel was a major challenge, especially for its finance team. The enterprise has hired people from outside Zambia to access the right skills for various roles. In addition, the enterprise has also trained and developed its original team members, such that they have risen from lower-skill jobs such as collecting sawdust to managing different aspects of factory operations.

### 3.6 Support received to date

The company has received both financial and non-financial support as grants, technical advisory, and mentorship from multiple entities. The key items of support received are as follows:

#### Financial

##### Beyond the Grid Fund Zambia

For the period 2017-23, the enterprise received a grant of US\$2.3 million from Beyond the Grid Fund Zambia for the sale of clean cookstoves and solar home systems. This grant helped ECS grow from employing 30 people to over 120 people. Moreover, the grant-making body closely guided the enterprise, helping

	<p>it set up its human resources practices and systems. It also helped the team to adopt a broader strategy and perspective for the future, setting the team on a growth path. As the fund wanted the enterprise to focus on the rural market, the ECS team was able to greatly expand its understanding of different regions in Zambia while assessing potential markets. Moreover, the team undertook extensive customer interactions, which led to the development of an in-depth understanding of different customer segments and their preferences. This understanding enabled ECS to enhance its customer engagement strategy and revise its product portfolio.</p>
<p><b>Non-financial</b></p>	
<p><b>LDI Africa</b></p>	<p>In 2016, Emerging Cooking Solutions received support from LDI Africa.<sup>41</sup> LDI Africa is a non-profit social enterprise that builds the capacity of African corporations, small businesses, and non-profit organizations. ECS received access to skilled personnel that helped it to sustain and grow its operations. The LDI fellow placed with Emerging Cooking Solutions had extensive experience with the pay-as-you-go model and fintechs and helped the enterprise develop its payment systems and build its call center team.</p>
<p><b>USAID's Alternatives to Charcoal (A2C) program</b></p>	<p>In 2022, the enterprise received support from USAID's Alternatives to Charcoal (A2C) program. This included the development of the electronics broods and Stove Use Monitoring (SUM) capability. Further, they provided training to enhance the enterprise's ability to fundraise and promote SupaMoto products to consumers in Zambia.</p>

\* Details of all other investment and non-financial support received can be found [here](#).

### 3.7 Key business drivers and challenges to growth

<p><b>Key business drivers</b></p>	
<p><b>Ecosystem</b></p>	<p><b>Organizational support:</b> ECS has received extensive support from the Swedish Embassy in Zambia. The Embassy enabled the enterprise to hold several meet-and-greets and events at the Embassy premises. It has also helped the business interact with the government and press, which has helped boost brand recognition. ECS has also benefited from its interactions with a Rwandan company that provides clean cooking stoves. Feedback from the company has been especially helpful in designing the ECS new stove's sourcing strategy. The Zambian government as well as several NGOs are working on creating awareness about the harmful effects of charcoal. These efforts have also helped generate demand for the enterprise's products.</p> <p><b>Policies:</b> Zambia's laws and policies support doing business in the country. No minimum local ownership or board representation is required for non-Zambian nationals setting up enterprises in Zambia. Moreover, grant funds are treated on</p>

par with investments and therefore do not require cumbersome approvals. When ECS was set up in Zambia, it received an investor's permit,<sup>42</sup> which gave the enterprise certain tax breaks on profits. The license also enabled the enterprise to import equipment.

**Founders' tenacity and ability to pivot business model for growth:** Both Marion and Mattias are deeply passionate about their mission of replacing charcoal with a cleaner fuel in order to improve health outcomes and reduce deforestation. In 2015, when the enterprise's factory burnt down and only a limited amount was recovered from the insurance policy, it was the founders' commitment to this mission and their tenacity that helped them continue the business despite the challenging circumstances. They decided to use the limited insurance payout to buy 2 small pellet-manufacturing machines and continued to build their business. Marion and Mattias have used their learnings to recognize when to persevere and when to change strategy, from distributing solar lights and cookstoves through the pay-as-you-go model to pivot to the subscription model for pellets, accordingly.

### Financial

The enterprise has benefited from several grants, especially from Nordic countries. These have ranged from small grants for specific projects to larger grants that the enterprise has used to buy equipment and stock. For instance, the grant from Beyond the Grid Fund Zambia in 2017 allowed the enterprise to develop a better understanding of customer preferences and to scale. The grant manager (REEEP)<sup>43</sup> was closely involved, guiding the enterprise to professionalize its operations, grow its team, and think strategically about its future plans.

## Challenges to Growth

### Ecosystem

**Competing with charcoal:** To replace charcoal as a fuel, Emerging Cooking Solutions needs to make biomass pellets as ubiquitous as charcoal. In rural areas, households have a limited capacity and willingness to pay for cooking fuel, and family members spend several hours gathering available firewood and biomass for cooking. This makes it challenging for ECS to acquire paying customers for its pellets in rural areas. In urban areas, many low-income households do not have the ability to purchase cooking fuel in bulk. Households typically buy fuel for each meal, even though this is more expensive in the long term. To cater to customer requirements, local entrepreneurs buy large bags of charcoal, split them into smaller bags, and sell them in local markets. Making similar small bags of biomass pellets available to users is financially unviable for ECS. To compete with charcoal usage, the enterprise targets low-income households that can afford to purchase a bag of pellets every 2 weeks or once a month. Furthermore, the enterprise has tried to reach users who cannot afford to purchase the larger bags of pellets by selling larger bags of pellets to local entrepreneurs at discounted rates. These entrepreneurs then divide the large bags into many smaller bags and sell them to ECS customers in local markets. The affordability of the ECS's clean cookstove was a challenge during the initial years of operation, as rustic stoves that use charcoal are available for as little as US\$2 (ZMW 33.8) to US\$4 (ZMW 67.6). ECS has addressed this by renting out the stoves as part of the pellet subscription package and recovering its cost over 18 to 24 months.

**Rules and regulations:** ECS has sometimes found it difficult to navigate changing rules and regulations related to permits and labor practices in Zambia. For instance, while selling solar lights, the enterprise realized that it needed separate permits for importing and selling solar components. Furthermore, the enterprise realized that if requisite fees were not paid in time, the regulations compound the fees, often leading to massive payment backlogs. To navigate this challenge, ECS leveraged the assistance of experts to obtain relevant permits and ensure that products are classified correctly. In 2019, ECS had over 20 full-time employees who were responsible for collecting offcuts from the pine forest and loading them onto trucks. These employees received the legal minimum wage and were provided a meal as well as tents to rest. However, the labor office requested the enterprise to provide these employees with a second meal and a per diem allowance, which was financially unsustainable for ECS. In order to address this challenge, ECS helped 2 former employees to set up a company to take over collecting the offcuts from forests. This company now provides its offcuts to ECS and other customers as well.

**Finding talent:** Identification of skilled personnel proved to be a challenge during the enterprise's initial years of operation. While recruiting through agencies, ECS realized that a number of applicants provided fake educational qualifications. To address this, the enterprise commenced recruitment through references. Moreover, the business also experienced financial fraud and as a result has hired several different accountants over the years. The enterprise also realized that people with high levels of experience have in many instances worked with international donor agencies and expected similar salaries and daily allowances. Matching the compensation levels offered by these international agencies is financially unviable for ECS. To address these talent challenges, ECS has hired international staff. The enterprise also established a partnership with LDI Africa to recruit and onboard skilled personnel. Lastly, ECS has also employed interns to enhance its operations and strategy. For instance, a graduate student from Karlstad University worked with ECS for a period of 6 months to identify and broaden the raw material base for sustainable pellet production in Zambia.

## Operational

**Ability to cater to large markets:** ECS markets its solution by working with several small communities at a time. Once it has saturated the demand in a particular area, it moves on to other areas. However, it does not have the capacity to provide stoves and pellets at a much larger scale. The business also has a limited distribution network, making it challenging to serve the larger Zambian market. Given the convenience of using charcoal, ECS must supply stoves and pellets quickly after the first meeting with potential consumers to reduce the chance of them returning to use of charcoal. This, too, restricts their ability to operate at a larger scale. ECS plans to raise funds to manufacture its own stoves as well as ramp up the production of pellets to address this demand.

**Sourcing of biomass/raw materials for pellet production:** Initially, ECS did not face any challenges in sourcing biomass from pine and eucalyptus plantations. However, replantation has not been consistent over time, while demand for waste biomass has increased. To ensure that ECS could continue supplying pellets at its usual price, the enterprise has had to partner with several small companies to source biomass for production of pellets. Furthermore, the enterprise is in talks with Zambia's Ministry of Energy to sign a Memorandum of Understanding that will ensure a more consistent supply of biomass. The enterprise has already explored the feasibility of using other biomass materials for the pellet production. It has tested the suitability of many different types of biomass for producing

	<p>pellets, including testing the viability of several grasses as well as various types of agro-waste. The enterprise is currently examining the possibility of using discarded cotton stalks from plantations in eastern Zambia as feedstock for its pellets. In the long run, the enterprise is also considering investing in fast-growing trees to meet its own production needs.</p>
<p><b>Financial</b></p>	<p><b>Currency fluctuations:</b> In an unfortunate incident in 2015, the enterprise’s factory burned down, as the neighboring forestry company caught fire. At this time, the Zambian Kwacha (local currency) was losing value. As the factory was insured in the local currency, the founders were unable to recover enough funds to establish another factory. However, the founders bought 2 pellet machines from the limited insurance money that they received and continued to serve their customers.</p> <p><i>“When the factory burnt down, we all sat around and wondered if we should just give up. But we were very idealistic and tenacious. So we said, no, we will continue. We bought 2 small pellet machines, which we set up in a farm. I mean, that’s the best we could do with the money we had then.”</i> <b>Marion Peterson, Co-founder Emerging Cooking Solutions</b></p> <p><b>Recovery of payments:</b> The enterprise has faced challenges in receiving timely payments from the pay-as-you-go model. Often, customers did not pay during the agreed-upon 6–24-month window, extending the payment time up to 3 years. Additionally, many low-income households, which have competing priorities such as meeting the education and nutritional needs of their family, stopped payments entirely and did not pay the remaining amount even after multiple home visits by the enterprise employees. The enterprise also tried working with self-help groups through Kiva. However, although this helped with the enterprise’s cash flow challenges, ultimately it did little to address the challenges faced while using the pay-as-you-go model. Eventually, the enterprise pivoted to a ‘subscription model’, under which consumers sign up for the pellet subscription service, paying a 1-time membership fee and then paying for pellets on a monthly or bi-monthly basis based on their consumption requirement. The enterprise recovers the cost of the stove from the pellet subscription fees within an 18–24-month timeframe.</p> <p><b>Access to and availability of finance:</b> The enterprise is facing challenges in accessing funding to scale its operations. ECS’s business model requires high capital expenditure, as the stoves are provided to the customers without any upfront payment. Further, inflows are protracted due to the small monthly payments received from the sale of pellets. Consequently, the enterprise faces cash-flow challenges and requires investments to accelerate growth, especially to manufacture stoves and increase production of pellets.</p> <p>Moreover, the limited pool of interested investors are more likely to fund the working capital needs of the business than provide risk capital to undertake research and development activities, which are needed to further enhance stove design and efficiency. Additionally, mainstream financiers (mainly banks) prefer collateral such as government bonds or land. However, the enterprise can only provide assets (such as equipment) as collateral. In order to address this funding gap, the enterprise has leveraged a number of grants to develop its own stoves and to boost the production of pellets. The enterprise has also started selling carbon credits to help boost its cash flow.</p>

## 4 - IMPACT DEEP DIVE

### 4.1 The impact theory of change of the enterprise

---

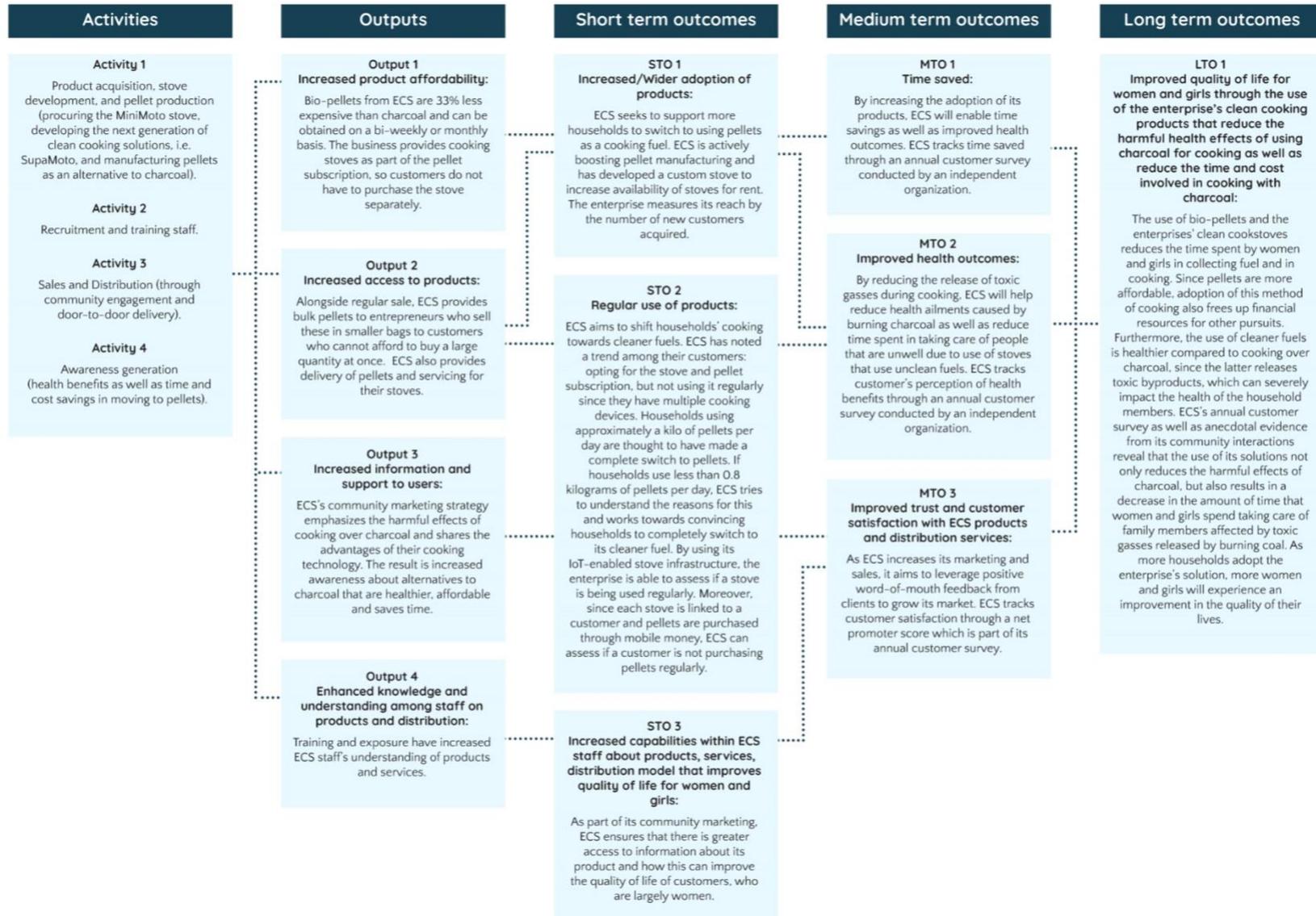
#### Mission statement

*The mission of Emerging Cooking Solutions (ECS) is to replace charcoal with more efficient cooking fuels, and thereby improve the quality of life for low-income women. ECS's model addresses issues of availability and accessibility of clean cooking fuel in urban and peri-urban areas.*

---

#### Theory of change

## Emerging Cooking Solutions' pathway to impact operates by reducing the time, cost, and negative health effects of cooking with charcoal



## 4.2 Current impact and measurement practices

ECS is focused on collecting data to make a business case for switching to its clean cooking solution. It has established a system of collecting stove usage data through its IoT-enabled stoves and pellet sales. Moreover, it tracks the sale of pellets, which are linked to individual stoves through a stove number and the user's phone number. This data collection is financed entirely from the enterprise's internal resources.

### Commercial data

Data about the customer is recorded at the time of signing up for the subscription service. This includes the customers' location, phone number, alternative contact details, details on their use of charcoal per month, and the size of the household. Furthermore, data on pellet sales (i.e. history of payments for pellets) is tracked through payment data, as pellets can be bought only via mobile money. Data on the use of the stove is tracked through ECS's proprietary IoT-enabled solution.

### Client survey on product impact

Since 2020, ECS has partnered with 60 decibels to collect data from its customers on product usage and its impact on the quality of their lives. Customers share their experiences and identify areas for improvement. The survey tracks impact by recording customer responses on how ECS's products and services affect time spent, spending and health. The survey also records customer satisfaction through a Net Promoter Score and examines factors that affect the score. Moreover, it tracks customers' assessment of value for money and their purchase experience.

### Emerging Cooking Solutions business impacts *(as per internal measurement system)*

#### 1. Reduced expenditure and increased income

- 63% of customers reported that their average weekly spending on cooking fuel had very much decreased since opting to use pellets and the SupaMoto stove.
- 2% customers indicated using the SupaMoto Cookstove for income-generating activities. Of these, 84% reported an increase in income as a result of using the cookstove.

#### 2. Improved well-being and reduced time poverty

- 60% of customers reported that their quality of life was much improved as a result of using the SupaMoto cookstove.
- 66% of customers indicated that the product had very much reduced the time spent on cooking.
- 26% reported that their or their family's health had very much improved since using the SupaMoto.

#### 3. Women focus

- 54% of customers served are female.
- 97% of all customers are first-time users of clean cookstoves like SupaMoto which signals that ECS is reaching an underserved customer base.

In the future, Emerging Cooking solutions would like to collect more evidence on the following questions:

1. How has the use of pellets affected the health outcomes of its users? Although ECS uses its customer survey to assess its impact on health, it would like to quantify the positive health outcome through established measures such as Disability Adjusted Life Years (DALYs).
2. How has the use of bio-pellets and the stove reduced the care workload on women and girls? ECS would like to quantify time savings on a weekly/monthly basis.

### Measurement challenges

1. **Resources:** ECS has channeled resources to track the sale of pellets and the use of the stove. It requires additional resources, both in the form of funding as well as human resources, to measure its impact along other parameters.

## 4.3 Customers' own experiences of the solution

Understanding the social context, emotional needs, preferences, and barriers faced by customers of ECS is key for potential investors to understand where ECS excels and where it has room to grow. The following sections provide insights into the foundation of the enterprise's market success and its impact on the lives of ECS customers, with the aim of helping investors make informed investment decisions.

To inform this analysis, the research team conducted 12 in-depth interviews to gather insights on the lived experiences and realities of users of the clean cooking stove. ECS customers refer to the cookstove by the product name, SupaMoto. This section presents the results of the qualitative impact deep dive, starting with a snapshot of the customers, followed by an examination of different customer personas and their journeys to using ECS products. This section concludes with a qualitative overview of ECS's impact on the daily lives of their customers.

### 4.3.1 Customer snapshot

Clean cookstoves are becoming a common household product in Zambia as women seek more efficient alternatives to charcoal or firewood stoves. Emerging Cooking Solutions, also known to customers as SupaMoto, aims to provide low- and middle-income households in Zambia with charcoal alternatives. Gaining insights into the social, emotional, and demographic features of ECS customers offers a window into understanding the needs, preferences and barriers faced by the user base, and thus an opportunity to identify ways in which the business can better adapt to meet customer needs.

All interviewed ECS customers were female, ranging in age from 33 to 65 years. Half the customers were widowed, while slightly below half of the respondents were married, and the remainder were single. They all lived in 5-person households with 2 children, aside from 1 customer who lived alone.

All customers were literate, with the majority having attained some or full secondary education. A very small portion of the sample had only received primary education and a quarter received post-secondary of a diploma or a bachelor's degree. This highlights that ECS products and services are appealing to customers with a variety of educational attainment levels.

Slightly less than half of all customers had engaged in business as a primary source of income, including activities such as selling clothes, working in salons, and domestic labor. A very small sample of customers reported selling 'SupaMoto' pellets on behalf of ECS. Slightly fewer than half of the customers stated they had professional experience working as teachers or for a non-governmental organization. However, a minority of the customers reported that they were unemployed and financially reliant on families or spouses.

The average household income range for an ECS customer varied from 1,000ZMW to 10,000ZMW (US\$57-US\$575)<sup>44</sup> per month, where the actual average was 4,222ZMW (US\$243). This surpasses the average national household income in Zambia and the international poverty line.<sup>45</sup>

A majority of the ECS customers that were interviewed were from regions where the subscription to the model to the stoves had not yet been introduced. However, a quarter of the respondents were from regions where they used the subscription model to rent the stove and purchased only the pellets. Regardless of the model used, the customers mentioned “purchasing” the stove and pellets for their use.

The ECS customers rented or purchased the stoves for various reasons. Most commonly, they considered SupaMoto to be relatively faster as compared to the traditional stove, “Brazier”. Most customers first saw the stove in use at their friends’ house or their church or were given product demonstrations at a group meeting. Most of the customers found the product to be affordable, safe, and financially efficient, and they expressed satisfaction with the reduced cooking and meal preparation time. It has also reduced the time spent in looking for firewood and charcoal. Traditional charcoal is quite expensive and unsustainable compared to that of the ‘SupaMoto’ pellets, which also encouraged them to purchase the stove.

Interestingly, all but 1 customer paid for the SupaMoto by themselves, despite

most not having formal jobs. This could perhaps be explained by their commitment and eagerness to enjoy the benefits of an innovative and clean cooking solution, including the flexible payment options offered by the enterprise.

### 4.3.2 Customer personas

The qualitative research revealed 3 distinct customer personas that use the SupaMoto cooking stove offered by Emerging Cooking Solutions. The 3 types of customer personas are:

- ❖ **The Bargain Seeker:** customer started using SupaMoto stoves as they wanted to save on costs and time related to cooking and domestic work.
- ❖ **The Upgrader:** customer historically used charcoal and is now looking for alternative cooking methods due to strong negative experiences with charcoal.
- ❖ **The Follower:** customer is influenced by others' use of the SupaMoto stove which results in them making a decision to purchase it.

The ECS customers were grouped into these 3 personas through a qualitative understanding of their characteristics, beliefs, attitudes, and behaviors. These personas are distinct from one another, representing the customers' main motivation, pain points and levels of awareness regarding the benefits they receive from ECS products. This analysis is intended to support ECS to refine their offerings to better meet customer needs.

Below is an in-depth examination of these 3 distinct personas.



### Jean's Bio

Jean is a 38-year-old business woman. She is married and has 3 children. Through her job she is able to earn about ZMW2,000 (US\$115) every month.

She is trying to balance her work at home against her business, and hence looks for products that are convenient and efficient in terms of cost and time. She discovered the stove by Emerging Cooking Solutions when her neighbor invited her to listen to the SupaMoto representatives speak about the product, and found it to be a cheaper alternative that could support her meal preparations for her children.

### Jean Namfukwe The Bargain Seeker

#### Demographic information (of the persona she represents)

**Age:** 38-50 years old

**Marital status:** Likely to be married or separated or a widow

**Children:** 3 children

**Education:** Likely to have completed secondary school

**Income:** ZMW1,000-2,500 per month (likely to belong to lower income bracket) (US\$57-144)

**Occupation:** Likely to be engaged in some form of paid work (business, driver)

**Average hours spent on care and domestic work:** 5 hours per day

#### Motivation

Jean was looking for a more affordable and convenient alternative method for cooking. Charcoal and electricity are becoming too expensive to afford alongside the costs of childcare and education.

Her neighbor, aware of her need to switch to an affordable alternative to charcoal, invited her to listen to SupaMoto representatives talk about the stove. She was immediately attracted by the cost-effectiveness of the stove and pellets, its flexible installment plan, and the convenience of being able to cook multiple dishes simultaneously. This would save her time on meal preparation and enable her to spend more time relaxing and engaging in hobbies. She spoke to her husband about the stove and how it would benefit the household. However, she purchased it through an installment plan and is paying the installments herself.

The stove gives Jean greater control over her day, enabling her to save money and focus on taking care of her children. She can cook breakfast and heat the children's bath water for them before sending them off to school. As the stove has allowed her to have more time during the day, she is able to be more involved in her business which results in an increase in income.

Jean's behavior reflects that of a *bargain seeker*, as she is motivated by the cost-effectiveness and convenience of the SupaMoto stove

*The Supa Moto stove is like a magic thing. I might be on my way home from work and I call my daughter to say to start preparing a meal. When I get home, I will find that the food is half ready and I can finish it very quickly.*

**The Bargain Seeker, 57 years old**

#### Some behavioral traits

- Jean's decision to buy the stove was made jointly with her husband. Her neighbor introduced her to the stove by inviting her to listen to the SupaMoto representatives speak about the stove, its advantages, and the payment plan.
- Purchasing the stove involved Jean and her husband traveling and standing in line for a few hours. Jean paid for the stove herself using the flexible installment plan offered by ECS.
- Jean is extremely satisfied with the SupaMoto stove as the reasonable installments and the affordability of the pellets has helped reduce household expenses, allowing her to contribute ZMW200-300 to household savings.
- The time efficiency of the SupaMoto stove has given her the bandwidth to be more involved in her business and increase her income stream.
- Jean shoulders most of the domestic and care workload at home. The convenience of the cooking process has given her more control over her time, which allows her to help her children with schoolwork and be more actively engaged in their lives. She has been able to go out and meet her friends more regularly, benefiting her social life. Improved balance between work, family, and friends has contributed to greater reported life satisfaction.
- Jean recommends the stove to women like her, who are burdened by the expense of charcoal and drained by domestic work.
- The disadvantage of using the SupaMoto stove is that there is no provision to roast certain types of food and that cooking pots can get spoiled.



### Charity's Bio

At 55 years old, Charity Ng'ambi is a widow and does not have children. She is unemployed and has 2 houses that she rents out for income. Through her rental income, she earns a total income of ZMW3,000 (US\$172) per month. After developing breathing difficulties while cooking with charcoal, she became motivated to switch to a product that is more sustainable and better for her health.

After having switched to the SupaMoto stove, she is less worried about the effects of cooking with charcoal impacting her health, as she also has free time to rest and relax. This has resulted in significant positive impacts on her well being. She believes in the long-term benefit of her investment and is inclined to explore other cooking products offered by the brand.

### Charity Ng'ambi

#### The Upgrader

#### Demographic information (of the persona she represents)

**Age:** 50–68 years old

**Marital status:** Likely to be widowed

**Children:** Likely to have 0–2 children

**Education:** Likely to have completed secondary education (Grade 10)

**Income:** ZMW3,000–5,000 per month (US\$172–282)

**Occupation:** Unemployed, likely to be dependent on her children

**Average hours spent on care and domestic work:** 6 hours per day

#### Motivation

Charity's main motivation to purchase and use the SupaMoto stove is her negative experiences using the traditional charcoal brazier. Charcoal braziers had a negative impact on her health, as it caused her to feel suffocated and sometimes faint. Charcoal braziers also impacted the health of her family, causing coughs and other respiratory illnesses. The cost of transporting charcoal from the market to her house was high, and she has had a number of negative experiences with charcoal sellers in the past, during which they would cheat her by adding on additional charges. Charity is aware of the negative environmental impact from the use of charcoal like deforestation and forest degradation. Furthermore, she finds charcoal difficult to store during the rainy season, as it gets wet and is unusable.

Charity was actively searching for alternatives to the traditional charcoal brazier when her nephew's wife introduced her to SupaMoto. When Charity switched from using charcoal, she immediately noticed the positive health benefits of using SupaMoto such as being able to breathe more easily and reduced illness among her family— and the financial benefits of not being overcharged by charcoal sellers.

Given her strong motivation to switch from charcoal, Charity is likely to continue using the SupaMoto stove and may upgrade to better products if she believes they are more sustainable and better for her family's health.

Her motivation to move from a charcoal cooking method to the SupaMoto stove exhibits typical “upgrader” behavior.

*Charcoal sellers were crooks sometimes. They would just put good charcoal on top of the bag then put very poor-quality charcoal inside the bag.*

**The Upgrader, 55 years old**

#### Some behavioral traits

- Charity is committed to switching her cooking methods and to provide a safer, healthier care environment for her household.
- Charity noticed a family member using the SupaMoto stove and asked her to demonstrate its function. After seeing the ease of using the stove, she purchased one for herself.
- She made the independent decision to purchase the SupaMoto stove and paid for it herself, indicating her strong motivation to switch from charcoal.
- She uses the SupaMoto stove twice a day, allowing her more free time to visit the market for essentials, as well as to rest and focus on her health.
- She hopes the pellets can become more readily available, because she often has to travel long distances or wait to purchase more.
- She is a vocal supporter of the SupaMoto stove benefits, and actively encourages her family and friends to purchase it, even championing its cause in her community by demonstrating its use



### Sheila's Bio

Sheila Chikele is 34 years old and lives with her husband and 3 children. She is a care worker and earns ZMW5000 (US\$282) per month. Sheila relies on the advice and recommendations of her friends and her church group to guide her decisions.

Sheila, in consultation with her husband, made the decision to purchase the SupaMoto stove after her social circle recommended it and vouched for its efficiency. It has proven to be a reliable and time-efficient method of cooking, allowing her to rely less on intermittent electricity supply and reduce time spent cooking. As a result, she has more free time to interact with her friends.

## Sheila Chikele

### The Follower

#### Demographic information (of the persona she represents)

**Age:** 33-45 years old

**Marital status:** Married

**Children:** Likely to have 2-4 children

**Education:** Likely to have less than secondary education

**Income:** Approximately ZMW4,000-5,000 per month (US\$229-287)

**Occupation:** Care worker

**Average hours spent on care and domestic work:** 8 hours per day

### Motivation

Sheila was introduced to the ECS SupaMoto stove through friends and her church group. The stove was highly recommended by her social circles due to its portability and cleanliness. Her friends demonstrated its function and efficiency when hosting her in their homes, which prompted her and 2 of her friends to register with a known SupaMoto representative. The representatives validated her National Registration Card and enrolled her in the payment installment plan. However, she later made the payment in full after consulting with her husband.

Sheila values the opinions of her social circle and uses them to guide her own purchase decisions.

She sees the main benefits of the stove as reliable and portable, meaning she can rely less on intermittent electricity and can cook from anywhere in the house. The stove has improved her confidence as a good host where she can now cook while engaging her guests in conversation.

Her responsiveness to her community's guidance and recommendations exhibits typical "follower" behavior.

*Two of my neighbors received and were using the stove but I did not pay attention. Until one day, I asked them how to get the stove and they said I had to go and register. I decided to send my child to go and register and that was how I registered because I had seen my neighbor using it, but now I have seen that it is good.*

### The Follower, 36 years old

### Some behavioral traits

- Sheila relies on her friend's opinions and recommendations when trying out something new and looks to validate this decision through her husband. This was the case for Sheila's introduction to the SupaMoto stove and decision to purchase.
- Sheila felt comfortable registering for the stove alongside 2 of her friends and she made the 1-time payment herself in full.
- Sheila uses the Supa Moto stove to cook all her meals, often 3 times a day. Its efficiency means she has more free time to engage in social activities with friends and members of her church group.
- Sheila enjoys being able to multitask and socialize while cooking for guests.
- Sheila's stove has stopped working in the past, but the Supa Moto representative repaired it for no charge under the 1-year warranty. Sheila proudly demonstrates the benefits and efficacy of the stove to those who visit her, encouraging others to purchase it.
- Her friends and family admire her ability to purchase the stove because it can be a symbol of financial stability. She is now free from the "bondage of buying expensive charcoal," which suggests that social admiration is a motivating factor

### 4.3.3 Journey maps

These personas are illustrative of how different customer groups discover and decide to use ECS products. In this section, journey maps are used to provide additional detail on the emotional experience of customers from awareness to purchase.

Journey maps are a visual representation of the highs and lows experienced by current customers as they access and use the services of ECS. In this way, customer journey maps can help ECS to identify opportunities for improvement and ensure that the needs, wants and constraints of various customer segments are considered in expansion and refinement of their products, services, or reach.

The journey to using the ECS stove starts with Awareness, in which potential customers discover the product. Consideration follows as they weigh their options and gather more information. Decisions are made in the third stage, where customers discuss with their family and decide to register or go to purchase the product. This is followed by Purchase and Payment. The next stage, Product Usage, marks their first experience using the product and experiencing its impact in their day-to-day life. This is followed by the customer clearing any outstanding dues. The journey ends with Loyalty & Advocacy, where the customers remain active users of the clean cooking stove and recommend it to others.

**Table 1:** The process a customer goes through while purchasing a clean cooking stove from Emerging Cooking Solutions

	Pre-product purchase		Product purchase		Post-product purchase		
Stage	Awareness and mobilization	Consideration	Decision	Payment and purchase	Product usage	Clearance of dues	Loyalty and advocacy
Activities	Customer seeks information or is made aware of the product	Customer evaluates the feasibility and impact of the product. A family decision is held	Customer registers for the product and approaches the source for purchase	Customer makes the first payment, registers their details, and brings the product home	Customer begins using the product and experiences its benefits	Customer clears any outstanding payments for the product	Customer reviews the product after its sustained use and promotes it
Customer goals	<p>An average customer is curious to know more about the new cooking solutions after observing it being used in their friend's houses and at their workplace. Most are actively looking for solutions that make cooking easier, cheaper, and faster.</p> <p>Potential customers look to engage with ECS representatives and attend demonstrations to</p>	<p>Women look to verify the efficacy of the product through the experiences of existing users in their community network.</p> <p>Purchase decisions are made after careful consideration of benefits versus costs and discussions with family.</p> <p>The customer identifies ways to</p>	<p>The customer seeks to obtain the product through the ECS representatives who visit the community.</p>	<p>The customer makes the payment, provides their identification details, and concludes the purchase process.</p> <p>The customer makes a down payment for their preferred installment plan. The customer also purchases the ECS pellets and firesticks at a reduced price.</p> <p>The customer takes the new stove</p>	<p>The customer experiences comfort using the product and incorporates it into their daily cooking routine.</p> <p>The customer experiences benefit of additional free time with more efficient cooking.</p>	<p>The customer completes their installment payments. Customers facing any challenges with making the payments can request an extension from ECS.</p>	<p>Customers evaluate their satisfaction with the product and their willingness to continue using it.</p> <p>They refer the product to friends, family and community members who might benefit from switching to a SupaMoto stove.</p>

	gain more information about the products, purchasing process, payment options, repair costs and its benefits.	pay for the product.		home.			
 <b>Emotions</b>	 Curious	 A mix of excitement and caution, requires effort	 Restful and satisfied	 Excited	 Happy but slightly stressed about repayment	 Excited	 Relaxed and satisfied
 <b>Levers</b>	<p><i>Community outreach</i> ECS benefits from high trust by existing customers who share their experiences of using the product within their network. This enables ECS to have a greater reach of potential customers.</p> <p>On-ground marketing representatives who conduct physical demonstrations allow potential customers to easily learn about the product.</p>	<p><i>Flexible payment</i> ECS provides flexible payment options to cater to diverse ranges of income, including group payment plans.</p> <p><i>Social influence</i> The favorable first-hand experiences of current product users online.</p>	<p><i>Accessibility</i> ECS representatives are available in the community readily approachable.</p>	<p><i>Limited hassle factors</i> The customers must make a small initial down payment to obtain the product. There are no additional costs other than the installments.</p> <p>There is only a short wait between registration and product delivery which reduces the likelihood of customers changing their minds.</p> <p><i>Demonstrations</i> Customers are able</p>	<p><i>Ease of use</i> Customers find it easy to incorporate the stove into their existing cooking routine and immediately experience the benefits.</p> <p><i>Outreach</i> There is high engagement from the ECS representatives who follow up on product services, guidance etc.</p>	<p><i>Flexible repayments</i> ECS is understanding and accommodates delays in repayments when customers raise genuine challenges.</p>	<p><i>High satisfaction</i> Most women are satisfied after using the Supa Moto stove and recommend it to other groups who would benefit single men, elderly, and mothers.</p> <p><i>Prevalent demand</i> There already exists a high demand for the product due to its popularity in the community.</p>

				<p>to address any doubts and concerns about transitioning to a new stove by attending a demonstration, which makes them feel secure about their decision.</p>			
 <p>Barriers</p>	<p><i>Mistrust in salespersons</i> In general, customers are not very responsive and ignore marketing representatives.</p> <p><i>Safety and usage concerns</i> Some prospective customers have the misconception that using the stove and adapting to it would be challenging. Customers raise concerns about its safety and ease or cost of repair.</p>	<p><i>Indecisiveness</i> Some women feel hesitant to register without first discussing it with their families. They feel concerned about making payments, installments, and credit decisions.</p> <p><i>Negative experiences with charcoal</i> Some users of other cookstoves have had negative experiences with use of charcoal and are thus weary of investing in a new type of fuel stove.</p>	<p><i>Lack of information</i> Some customers struggled to find where to buy the product Others found it too expensive to purchase immediately and were unaware of the flexible payment options.</p> <p>At times, stock of SupaMoto is limited, which can discourage customers if they have to wait a while to receive the stove.</p>	<p><i>Unaffordable</i> Some customers felt that the average installment per month was too expensive for potential customers with competing priorities for their limited income.</p>	<p><i>Product monitoring</i> Some customers need more time to adapt to the new stove. Faster cooking times can lead to food burning if the stove is not attended to.</p> <p><i>Effortful maintenance</i> Some customers noted a lot of smoke and worried the stove would damage the pots after sustained use. Some customers recommended that pots and lids should be sold with the stove.</p> <p>Customers are responsible for</p>	<p><i>Recurring costs</i> Customers are required to purchase the pellets every month, as without them, they cannot use the stove and it is disabled by ECS. This is a point of fear for several customers who are not able to buy the pellets regularly.</p>	<p><i>Inaccessibility</i> Not all potential customers were in an accessible range of a retail outlet or stove repair centers.</p> <p>There is no permanent sales point for the biomass pellets, so customers have to wait for the specific available dates.</p>

maintenance and cleaning the stove, and some found the process of removing old pellets before adding in new ones quite tedious.

There is an additional cost for repair after the 1-year warranty period, which may be a problem for some customers.

### 4.3.4 Emerging Cooking Solutions's impact

This section presents the impact of the ECS product on customers' daily lives, based on qualitative data. The quotes below are the customers' own words.

All customers reported experiencing positive changes in their lives since using the ECS stoves, including reduced time spent preparing meals, reduced costs on charcoal and electricity, improved health, and increased free time. The impact has been consistent across all customer personas: The Bargain Seeker, The Upgrader, and The Follower.

#### Qualitative evidence of theory of change

##### Long-term outcome

**LTO1:** Improved quality of life for women and girls through the use of the enterprise's clean cooking products that reduce harmful health effects, time and costs involved in cooking with charcoal.

- **Improved health:** Women are less likely to experience coughs, suffocation, and smoke-related health issues, such as chest-pain and bronchitis, after adopting the SupaMoto stoves, which emit fewer indoor air pollutants than traditional charcoal stoves.

*"The issues of suffocating when you are using a brazier are no longer there with Supa stove, in terms of health SupaMoto cooker stove has no negative impact on your health."*

**The Upgrader, 56 years old**

- **Improved well-being:** Customers reported greater life satisfaction and an improvement in their mental well-being since using the product. With a stove that is faster than the traditional charcoal brazier, they no longer must plan their day around meal preparation.

*"We are proud of it. It has brought about life satisfaction in the sense that cooking is no longer a difficult task, even when I have customers for hairdressing, I cook while providing hairdressing service to them. For those who have not seen it before, they admire it very much whenever they visit my home because they find me using the cookstove."*

**The Bargain Seeker, 38 years old**

- **Increased free time:** Customers saw the SupaMoto stove as an opportunity for more efficient time management for household chores. On average, women reported saving 1–3 hours since using the SupaMoto stove. Women report having more time for leisure activities like resting, taking care of their health, listening to music, or checking in on their friends. A few customers reported using this extra time to complete other household chores or earn additional income.

*"I like to use the time for relaxing and listening to gospel music."*

**The Upgrader, 56 years old**

- **Reduced expenditure:** Customers reported reduced expenses on charcoal, electricity and traveling to purchase charcoal. The SupaMoto stove uses relatively inexpensive and affordable pellets which enables customers to save between K100–500 per month on average.

*"I spend over a thousand on this electricity but now I am seeing myself spending maybe 500 so, I am able to save 500."*

**The Bargain Seeker, 57 years old**

- **Redistribution:** There is some evidence of men cooking in a mainly female household in order to help the women with the housework and carry some of the care workload at home. The stove has made it easier for women to cook and has given them greater control of their day.

*“I am not stressed now, as compared to previous times because that time I would just receive a call from work to say you are required to come to work immediately. At such a point, I would have to leave the house fast and have to eat something quickly, but I could not because I have to light the fire which takes very long, so I would not eat. But now, I use the electric stove, this time I can eat, and food can be prepared for me, whilst everyone at home can do their own things at home.”*

**The Bargain Seeker, 57 years old**

*“My grandchildren have benefited because when going to school, they just light the stove and in a short time the meal is ready, they eat and they go.”*

**The Bargain Seeker, 57 years old**

- **Society’s perception of the household after SupaMoto purchase:** Customers report that there is a common social perception that owning the SupaMoto signifies wealth. Community members inquired about how they were able to afford them, often resulting in some form of positive admiration.

*“All those people who do not have stoves admire my household. They say that now my household is free from the bondage of buying expensive charcoal.”*

**The Upgrader, 55 years old**

*“They think the SupaMoto stove is very expensive, and they see me as having money because I use it.”*

**The Follower, 54 years old**

#### Medium-term outcomes

**MTO1:** Time saved from consistent use of ECS’s more efficient cooking products.

**MTO2:** Improved health due to reduced air pollution from burning charcoal; Reduced time spent caring for family members with respiratory illnesses due to use of unclean fuels.

**MTO3:** Improved trust & customer satisfaction with ECS’s products and distribution services.

- **Time savings:** Increased adoption of ECS products has led to significant time savings on a day-to-day basis, as customers no longer have to travel for long hours just to purchase fuel or coal.

*“Cooking used to take me maybe 2 hours. It takes me less than 30 minutes and I will be done.”*

**The Follower, 34 years old**

- **Reduction in health ailments caused by burning charcoal:** Most customers reported a reduction in health ailments that they previously suffered from due to toxic fumes released while using charcoal braziers indoors. When using SupaMoto stoves, they reported fewer headaches, not feeling suffocated, or fainting while cooking.

*“When I was using the brazier, I used to have a lot of headaches, but I no longer have them.”*

**The Follower, 34 years old**

- **Trust and customer satisfaction:** A majority of customers reported high levels of satisfaction with ECS products. Most women reported the speed and convenience of cooking as their primary reason for satisfaction, while others appreciate the time and money saved while cooking. A few customers complained about SupaMoto stoves releasing smoke when the stove was low on pellets and the frequency and expense associated with buying new pellets. The pellets are also only available at certain times, which can be an inconvenience to women, especially if their stove may become disabled. Some women hoped that ECS would make the stove more widely available so that more people can purchase it.

Respondents expressed these complaints freely and openly, knowing that their feedback would be taken seriously, indicating trust in ECS and a desire to continue to engage with the business. Overall, the ECS product has been well-received by the women who have used them with a few minor complaints.

*“Their system of saying that if I haven’t bought pellets for 1 month then they disable it is not helping us. There are a lot of factors that make a person not buy pellets. Sometimes, it is because we have no cash, or we have enough pellets from the previous purchase. So that system should be revisited. We are their customers, we cook every day, we get hungry every day, and we need pellets every time. Why should they treat us like we are people who can run away from them without paying?”*

**The Upgrader, 55 years old**

*“It is not always that it produces smoke. It just happens sometimes. Especially when changing the pellets if not properly done, that is when it produces a scent which causes flu.”*

**The Bargain Seeker, 38 years old**

**Short-term outcomes**

**STO1:** Increased/wider adoption of products.

**STO2:** Increase in regular use of ECS products.

**STO3:** Increased capabilities within ECS staff about products, services, distribution model that improves quality of life for women and girls.

- **Wider adoption of products:** ECS SupaMoto stoves have been adopted by households in Zambia, with customers recommending it to their neighbors, family, friends, colleagues, and members of their church group. Problems with the stove are promptly addressed by SupaMoto representatives and there is only a slight learning curve for using the stove.
- **Regular use of products:** Most households reported regularly using the SupaMoto stove for cooking 3 meals a day for their family, boiling water for their children’s bath before sending them to school, and for efficiently preparing a meal when they had guests over. Respondents reported a significant time reduction in cooking, ranging from 1–6 hours. A minority of the customers interviewed reported occasionally using charcoal stoves. The regular purchase of pellets seems to be a recurring fear for customers as they do not want their stove to be cut off.

*“They told us that the SupaMoto stove was not sold permanently to us, instead they had lent us the stoves. All that they expected us was to be buying pellets every month for it to continue working. If we do not buy pellets for 2 months, they will come and confiscate the stove from us, and the stove can be given to other people.”*

**The Bargain Seeker, 38 years old**

- **Increased capabilities within Emerging Cooking Solutions:** While the SupaMoto stove generally benefits the entire family, women and girls benefit the most because reduced care and domestic workload results in increased time for rest, relaxation, other work, and socialization. Most respondents reported recommending the stove to neighbors, friends, and family members, especially women. Some even reported recommending it to single men, as it would ease their domestic workload. Further, almost all respondents were introduced to the stove by a woman, indicating that information about the stove is accessible and well-received among women and girls in their communities.

*“I would give it to my auntie because it is a good product so I would want her to have the experience that I have had with it.”*

**The Follower, 49 years old**

*“I would give it to my friend or my daughter because it cooks fast. It will help her with preparing porridge for the baby in the morning. It would really help her.”*

**The Bargain Seeker, 65 years old**

*"I can give it to Kosmas because he loves it. He is a teacher who is single. So, the stove can help him cook fast, especially in the morning when preparing to go to work. It will help with cooking fast. You when you are single. It is difficult to cook sometimes."*

**The Upgrader, 57 years old**

#### Outputs

- O1:** Increased product affordability.
- O2:** Increased access to time and cost-saving products & services.
- O3:** Increased information & support to users on adopting and using clean fuel.
- O4:** Enhanced knowledge and understanding among staff on products and distribution.

- **Affordability:** All respondents appreciated the option to pay in installments and affordability was one of the primary reasons customers purchased the product. ECS awareness and training efforts were successful in conveying the utility, cost, and time-saving benefits of the product.

*"It has lessened the burden of work. It has made cooking easier, and the pellets are cheap. It cooks very fast such that even if you have somewhere you are going, cooking would not be a problem. For those with a working husband, the stove is fast such that they can prepare food and boil bathing water within a short time."*

**The Upgrader, 57 years old**

*"The main benefit is that SupaMoto Pellets are not as expensive as charcoal. Normal charcoal is very expensive when buying day to day and so we have been able to afford the pellets provided by SupaMoto."*

**The Bargain Seeker, 65 years old**

- **Maintenance:** Customers do not report spending any money on product maintenance although many thought they would have to. While most clean and maintain the products themselves, a few reported requesting support from ECS for product maintenance. They found this support service to be simple and easy to access as they just had to dial the number of the call center and would be connected to a repair person. Most customers found the training they received by the representative when purchasing the stove to be useful and effective.

*"No. In my case, I have not incurred any costs to do with maintenance."*

**The Bargain Seeker, 55 years old**

*"Sometimes if it has failed to work, we just take it to the agent, who in turn takes it to the company for repair."*

**The Upgrader, 38 years old**

- **Value addition of the products:** The product has provided value in terms of cost, time, and social and environmental changes. Customers reported feeling more empowered to manage their time, and male contribution to care and domestic work increased as a result. More women reported being conscious of the choices they made with regards to the environment and the harm caused by the use of pellets and generation of smoke. There was increased adoption and awareness of sustainable choices.

*"Traditional charcoal is the main contributor towards deforestation."*

**The Upgrader, 57 years old**

*"The first thing is that charcoal is expensive and the second thing is that they are trying to ban the cutting of trees for charcoal making."*

**The Bargain Seeker, 65 years old**

## 5 - LOOK FORWARD

### 5.1 Growth and sustainability plans

 <p>Increase the number of customers served</p>	<p>The enterprise aims to gradually increase the number of customers served through the subscription model around the Copperbelt and then in Lusaka by the end of 2023. Furthermore, it plans to increase its customer base at the rate of 600 customers per month in 2024 and 800 customers per month in 2025, with the overall aim of serving a total of 50,000 customers in the next several years through its subscription model. The enterprise currently has 3,000 customers that subscribe to its pellet subscription model. Serving 5,000 customers through its subscription model will allow the enterprise to break even. The enterprise is also working to convert the rest of its customer base to the subscription model. The enterprise also plans to focus on marketing pellets to small entrepreneurs, as they can prove to be effective marketers of its solution for their communities.</p>
 <p>Scale-up production and improve distribution of pellets</p>	<p>The enterprise has the capacity to produce 1,000 tonnes of pellets per month. However, it is currently producing 200 tonnes per month and plans to gradually scale up the production of pellets. Furthermore, it aims to diversify the raw materials used to produce pellets by adding agro-waste feedstock as well as independently invest in fast-growing trees. This will consequently reduce its dependence and price sensitivity to feedstock from plantation forestry residue. The enterprise also aims to expand its pellet distribution by increasing its storage capacity and the number of depots and distribution vehicles.</p>
 <p>Geographic expansion</p>	<p>The enterprise aims to create a franchise model in other African countries. It plans to provide franchisees with cookstoves that are enabled to capture carbon credits and/or the IoT platform to monitor carbon credits. So far, 2 enterprises in Africa have acquired and integrated the enterprise's IoT platform into their clean cooking operations. These enterprises pay an onboarding fee for using the IoT platform and then pay an ongoing subscription fee (per customer, per month).</p>
 <p>Generate revenue from carbon credits</p>	<p>The enterprise aims to generate revenue from carbon credits. In 2020, it started the process of registering a Program of Activities with Gold Standard Foundation, using the enterprise's "Methodology for Metered and Measured Energy Cooking Devices." The enterprise has also in parallel developed a blockchain based end-to-end system with another company, <a href="#">ixo</a>, which can issue and validate carbon credits in the near-real time based on digital-MRV, and a 2-step validation process (including causal AI by French company <a href="#">Scalnyx</a>). It went live in July 2023 and is probably the first of its kind solution for the clean cooking sector.<sup>46</sup> This platform will enable the enterprise to sell its credits at a better value and potentially shorten the time taken to realize revenue from carbon credits from the usual 18 to 24 months. This will, in turn, instantly and positively impact the enterprise's cash flow. The enterprise plans to use the funds generated through the sale of carbon credits to purchase more cookstoves.</p>



### Expand catalog of products

The enterprise is developing its own SupaMoto stove that has large performance improvements such as 30% less fuel used compared with the existing market leader as well as more control over cooking temperatures. The enterprise is manufacturing this stove in South Africa. ECS is also in the process of developing an institutional stove which can serve larger entities like school canteens and army barracks. The enterprise plans to develop this over the course of the coming year and eventually be able to provide this stove to various types of consumers, from roadside street food vendors to larger restaurants.

ECS is also exploring partnerships to expand the use of its IoT platform. As the enterprise's IoT platform primarily monitors usage, it can be used in various settings, especially to demonstrate impact. In the coming years, ECS would like to undertake research to develop solutions for the largest consumers of charcoal in Zambia. For instance, it is interested in partnering with companies that use coal as a heating solution for rearing poultry.

## 5.2 Ask of investors and stakeholders

### Financial

In 2024, the enterprise is seeking US\$4 million in equity or quasi-equity. These funds will be used to meet the working capital needs of the enterprise. ECS's largest financial need is capital to purchase additional stoves. It also requires capital to manufacture its own prototype of clean cooking stoves. In addition, the enterprise plans to utilize capital for the purchase of trucks for transport.

### Non-financial

**Strategic support:** The enterprise is looking for strategic guidance to help it navigate organizational changes necessitated by future growth. Moreover, it requires assistance to transition existing customers to the subscription model.

**Technology support:** The enterprise is seeking IT development support to further enhance its IoT platform.

**HR:** The enterprise is seeking to hire a Logistics Manager to improve operations for procurement of raw materials used to manufacture pellets, as well as the distribution of stoves and pellets.

### 5.3 Lessons learned

During its initial years of operation, ECS provided cookstoves through a pay-as-you-go model. However, it soon realized that many customers were unable to keep up with long-term payment plans. While in some cases this resulted in very long payment cycles, in others it resulted in losses, as the enterprise was unable to recover the cost of the stove. Moreover, many customers believed that they owned the stove, as they had made partial payments and refused to return the stove to the enterprise, despite defaulting on payments. Over time, ECS understood that recovering payments was a challenge. It realized the need to shift the focus from the clean cookstove to clean cooking fuel: the bio-pellets. Hence, it moved to the subscription model, whereby customers bought a subscription service for pellets and the stoves were provided or rented to the consumers only as a means of using the clean fuel. However, ownership of the cookstove remained with the enterprise.

When ECS was selling through companies, it realized that a lot of the male sales staff would market to companies where they knew other men. Male customers liked the stove because it offered features like a fan and buttons for optional settings, etc. However, as cooking was largely the responsibility of women, women felt that men were making decisions over something that was their domain, and therefore were reluctant to use the stove. Consequently, ECS realized it had to market to whoever was responsible for cooking in individual households and switched over to community marketing.

The enterprise's experiences show that it is critical to not only focus on sales but also understand customer usage of its products. The enterprise's review of customer sales and usage data showed that although it had acquired a significant number of customers, not all of them were fully utilizing the cookstove or buying pellets regularly. Though growing its customer base had positive financial implications, it did not further the enterprise's mission to a similar extent, as many stoves remained unused. Hence, the enterprise realized that it needed to focus on getting consumers to completely switch their charcoal use with the pellets and cookstove. Thus, it worked on building a deeper understanding of the consumers and focused on acquiring those customers that had the potential to fully utilize the clean cooking solution.

As the enterprise started to engage with local communities, it realized that its target consumers often mistook the founders for foreign aid workers and responded better to local staff members. Hence, the company began developing capacities of local staff to lead its marketing efforts. The enterprise had originally focused on marketing pellets as an alternative to charcoal, highlighting its negative impact on the environment. However, it soon realized that although this was an important consideration, affordability mattered most to customers. Thus, it decided to highlight the cost and time savings afforded by its solution. During its community interactions, the enterprise also developed a better understanding of the consumer and their requirements, which has led it to innovate and develop its own

stove. The new product enables better control of the flame, allowing it to cater to a wider variety of cooking needs.

During the pandemic, the enterprise was unable to expand at the planned rate, partially because it did not have batteries for the MimiMoto stove. The batteries were imported from China and took almost 1.5 years to reach Zambia as a result of COVID-19 related supply chain disruptions. Going forward, as ECS develops its own stove, it plans to manufacture in Africa such that its supply chain relies on sourcing destinations that are closer to their operations.

## 5.4 Recommendations for policymakers, investors, and entrepreneurs

 <p><b>Policymakers</b></p>	<p><b>Discourage use of charcoal:</b> Given the far-reaching impact that the use of charcoal has on deforestation as well as on the health of households, policymakers should develop policies that restrict the use of charcoal and provide impetus to the development of alternatives. Such measures can include providing smart subsidies, concessional loans, loan guarantees, as well as tax or financial incentives and waivers to enterprises providing alternatives to charcoal, especially for procuring biomass energy capital equipment. Policymakers can also develop policies that encourage investment in researching alternatives to charcoal. They can encourage investment in the clean cooking space by providing tax breaks/financial incentives/recognition to institutions that provide patient capital to such enterprises. They can also encourage multinational institutions to provide results-based financing to such enterprises instead of providing aid. Moreover, policymakers can also design tax incentives for consumers to adopt alternatives to charcoal, especially clean cooking solutions. Finally, government agencies can collaborate with civil society organizations to undertake awareness-building initiatives that highlight the harmful effects of using charcoal as well as discuss the benefits of alternatives like electricity, biofuels, etc. Together, these measures can support the clean cooking sector and move the country towards achieving its target of universal access to clean and modern cooking solutions.</p>
 <p><b>Investors</b></p>	<p><b>Time taken to raise capital:</b> Fundraising is a time-consuming process. For a small and growing business, the management team often needs to spend significant time on fundraising activity. This can result in a negative impact on the business as the management team often has multiple responsibilities and limited personnel to manage ongoing operations. A short and structured fundraising process can help reduce the time spent on raising capital.</p> <p><b>Increase availability of risk capital to address challenges faced by underserved customers:</b> The enterprise has observed that there are a limited number of investors that are willing to provide risk capital to undertake activities in research and development (R&amp;D). For instance, investors are more likely to fund working capital needs of a business rather than fund R&amp;D to</p>

	<p>enhance stove design and efficiency. This inhibits the ability of enterprises to further enhance their products and services to serve underserved customers.</p>
 <p>Entrepreneurs</p>	<p><b>Develop an understanding of the local context:</b> It is important for entrepreneurs to recognize the local context in which they operate. Entrepreneurs can improve their understanding of customer preferences and habits by undertaking regular interactions with the communities they operate in and establishing relationships with their customers. Entrepreneurs must also be conscious of the cultural and social norms that influence their consumers as well as their employees. The co-founders suggest that entrepreneurs can sensitize themselves by leveraging local employees' knowledge. In addition, the co-founders emphasize that entrepreneurs must strive to develop an understanding of the macro political, cultural and economic factors that influence business operations in their regions of operations. They can develop this understanding by interacting with other local businesses, learning from experts, and maintaining a keen sense of observation.</p>

## ENDNOTES

<sup>1</sup> The Tier is assigned as per the Multi-Tier Framework which measures cookstoves on 6 attributes: (i) exposure, (ii) efficiency, (iii) convenience, (iv) safety, (v) affordability, and (vi) fuel availability. “Modern energy cooking services” refers to a household context that has met the standard of Tier 4 or higher across all 6 measurement attributes.

<sup>2</sup> EEP Africa. (2019). Emerging Cooking Solutions Zambia. <https://eepafrica.org/Portfolio/emerging-cooking-solutions/>

<sup>3</sup> Clean technologies are those that attain the fine particulate matter (PM2.5) and carbon monoxide (CO) levels recommended in the WHO global air quality guidelines (2021). Stoves corresponding to certain tier levels align with the WHO Guideline levels which confer minimal health risk. Based on laboratory testing, a stove that achieves either Tier 4 or Tier 5 for PM2.5 emissions is classified as clean for PM2.5 emissions. For CO emissions, Tier 5 stoves are rated as “clean” whereas Tier 4 stoves are rated as “transitional.” It must be noted that only stoves categorized as Tier 5 is considered clean for health. WHO. (2021). Defining clean fuels and technologies. <https://www.who.int/tools/clean-household-energy-solutions-toolkit/module-7-defining-clean>

<sup>4</sup> World Bioenergy. (2022). Advanced Biomass Cooking for a Billion People. <https://www.worldbioenergy.org/uploads/220210%20Mattias%20Ohlson.%20Emerging%20Cooking%20Solutions.pdf>

<sup>5</sup> The enterprise produces the pellets from biomass (branches, offcuts, sawdust) from the forestry plantations and myriad small saw millers. The enterprise processes the biomass (drying, chipping, hammer milling, pressing, cooling, bagging) into SupaMoto pellets. These pellets have increased thermal efficiency and are 33% cheaper compared to current average customer spend on charcoal.

<sup>6</sup> World Bank. (2023). The World Bank in Zambia, Country Overview. <https://www.worldbank.org/en/country/zambia/overview>

<sup>7</sup> World population review. (2023). Population of Cities in Zambia. <https://worldpopulationreview.com/countries/cities/zambia>

<sup>8</sup> World Bank. (2021). GDP (current US\$)- Zambia. <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=ZM>

<sup>9</sup> Statistics Times. (2021). List of African countries by GDP. <https://statisticstimes.com/economy/african-countries-by-gdp.php>

<sup>10</sup> Standard Bank. (2023). Zambia: Economic and Political Overview. <https://www.tradeclub.standardbank.com/portal/en/market-potential/zambia/economical-context>

<sup>11</sup> Kesselring, R. (2017). The electricity crisis in Zambia: Blackouts and social stratification in new mining town.

- 
- <sup>12</sup> International Growth Centre. (2016). Lights out: Zambia's electricity crisis. <https://www.theigc.org/blogs/lights-out-zambias-electricity-crisis#:~:text=Left%20without%20electricity%2C%20low%20levels,accelerated%20the%20rate%20of%20deforestation>
- <sup>13</sup> Energy Africa. (2018). Zambia Final Report. [https://www.gogla.org/sites/default/files/resource\\_docs/zambia\\_fiscalanalysis\\_finalreport\\_201803\\_v2\\_2.pdf](https://www.gogla.org/sites/default/files/resource_docs/zambia_fiscalanalysis_finalreport_201803_v2_2.pdf)
- <sup>14</sup> Habitat for Humanity. (2018). Housing poverty in Zambia. <https://www.habitatforhumanity.org.uk/country/zambia/>
- <sup>15</sup> UNICEF. (2018). Water, Sanitation, and Hygiene. <https://www.unicef.org/zambia/water-sanitation-and-hygiene>
- <sup>16</sup> UNICEF. (2018). Water, Sanitation and Hygiene. <https://www.unicef.org/zambia/water-sanitation-and-hygiene>
- <sup>17</sup> Solid fuels refer to different types of solid materials that can be burnt to release energy, typically in the form of heat and light.
- <sup>18</sup> Aemro, Y. B., Moura, P., & de Almeida, A. T. (2021). Inefficient cooking systems a challenge for sustainable development: a case of rural areas of Sub-Saharan Africa. *Environment, Development and Sustainability*, 23(10), 14697-14721.
- <sup>19</sup> Silimina, D. (2020). Up in flames. D+C - Development + Cooperation. <https://www.dandc.eu/en/article/zambian-poor-are-increasingly-subject-fire-hazards-charcoal-and-firewood-they-use-heating>
- <sup>20</sup> Tembo, S., Mulenga, B., Richardson, R. (2018). Electricity access and charcoal consumption among urban households in Zambia. *Development Southern Africa* 36(5), 585-599. [https://www.researchgate.net/publication/327404987\\_Electricity\\_access\\_and\\_charcoal\\_consumption\\_among\\_urban\\_households\\_in\\_Zambia](https://www.researchgate.net/publication/327404987_Electricity_access_and_charcoal_consumption_among_urban_households_in_Zambia)
- <sup>21</sup> USAID. (2021). Alternatives to Charcoal. United States Agency International Development/Zambia Tetra Tech/ARD. [https://pdf.usaid.gov/pdf\\_docs/PA00ZPMG.pdf](https://pdf.usaid.gov/pdf_docs/PA00ZPMG.pdf)
- <sup>22</sup> Dalberg. (2018). Cleaning up cooking in urban Kenya with LPG and bio-ethanol. <https://dalberg.com/our-ideas/cleaning-cooking-urban-kenya-lpg-and-bio-ethanol/>
- <sup>23</sup> FAO. (2018). National Gender Profile of Agriculture and Rural Livelihoods – Zambia. Country Gender Assessment Series. Lusaka. <https://www.fao.org/3/i8461en/i8461en.pdf>
- <sup>24</sup> Energy Africa. (2018). Zambia Final Report. [https://www.gogla.org/sites/default/files/resource\\_docs/zambia\\_fiscalanalysis\\_finalreport\\_201803\\_v2\\_2.pdf](https://www.gogla.org/sites/default/files/resource_docs/zambia_fiscalanalysis_finalreport_201803_v2_2.pdf)

- 
- <sup>25</sup> Uchenna, E., & Oluwabunmi, A. O. (2020). Cooking technology and female labor market outcomes in sub-Saharan Africa. *African Development Review*. doi:10.1111/1467-8268.12468
- <sup>26</sup> UNEP. (2021). Seven things you should know about household air pollution. <http://www.unep.org/news-and-stories/story/seven-things-you-should-know-about-household-air-pollution>
- <sup>27</sup> World Health Organization. (2022). Household air pollution. <https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health>
- <sup>28</sup> Onyinyechi, B., & Orish, E. (2020). Exposure to wood smoke and Associated Health effects in Sub-Saharan Africa: A Systematic Review. *Annals of Global Health* 86(1), 32. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7082829/>
- <sup>29</sup> Ritchie, H., & Roser, M. (2022). "Indoor Air Pollution," Our World in Data, <https://ourworldindata.org/indoor-air-pollution#death-rates-have-declined-in-almost-all-countries-in-the-world>
- <sup>30</sup> Price, M., Jones, T., Scott, N. (2021). Zambia; Cooking transitions, Working Paper. Modern Energy Cooking Services. <https://mecs.org.uk/wp-content/uploads/2021/03/Zambia-cooking-transitions-MTF.pdf>
- <sup>31</sup> Philanthropy News Digest. (2023). Spark+ Africa Funds \$3.5 million for clean cooking stoves in Zambia. <https://philanthropynewsdigest.org/news/spark-africa-funds-3.5-million-for-clean-cooking-stoves-in-zambia#:~:text=Spark%2B%20Africa%20funds%20%243.5%20million%20for%20clean%20cooking%20stoves%20in%20Zambia,-June%2023%2C%202023&text=Spark%2B%20Africa%2C%20an%20impact%20investment,clear%20cooking%20movement%20in%20Africa>
- <sup>32</sup> The Tier is assigned as per the Multi-Tier Framework, which measures cookstoves on 6 attributes: (i) exposure, (ii) efficiency, (iii) convenience, (iv) safety, (v) affordability, and (vi) fuel availability. "Modern energy cooking services" refers to a household context that has met the standard of Tier 4 or higher across all 6 measurement attributes. <https://www.worldbank.org/en/topic/energy/brief/fact-sheet-multi-tier-framework-for-cooking>
- <sup>33</sup> ECS distributes MimiMoto stoves that are imported from a supplier in the Netherlands, and manufactured in Shenzhen, China. It has also developed its own stove SupaMoto, which comes with performance improvements such as using 30% less fuel and providing more control over cooking temperatures.
- <sup>34</sup> These prices are as of December 2022. The exchange rate used is US\$1=ZMW 16.9 as per the Bank of Zambia's average for 2022.
- <sup>35</sup> Supamoto. (2023). Renewable home energy for Zambia. <https://www.supamoto.co.zm/>
- <sup>36</sup> A third co-founder Per Lofberg was initially responsible for fundraising at ECS. However, he no longer plays an active role in the enterprise and therefore has not been profiled.

---

<sup>37</sup> 2X criteria can be found [here](#). We drew on the leadership, entrepreneurship, employment and consumption criteria in our assessment.

<sup>38</sup> We assessed businesses that worked in the sectors of energy and emissions or water and sanitation against 4 climate and gender justice criteria related to: environment and land use; health, safety and security; education and training; and time use.

<sup>39</sup> Businesses were assessed on a 21-point scale, with scores of 0–7 being gender unintentional, scores of 8–14 being gender intentional and 15–21 being gender transformative.

<sup>40</sup> Businesses were assessed on a 12-point scale where 0–4 was gender unintentional, 5–8 was gender intentional and 9–12 was gender transformative.

<sup>41</sup> VC4A. (2023). LDI AFRICA- strengthening Africa Institutions for Global Success. <https://vc4a.com/ldi-africa/>

<sup>42</sup> An [Investor's Permit](#) can be issued to a foreigner (above the age of 18 years) intending to establish a business or invest in Zambia or who has established or invested in a business in Zambia, or is joining an already existing company. Through the Zambia Development Act No. 11 of 2006, companies can avail various benefits in terms of exemptions and concessions for companies that invest in priority sectors, MFEZ, industrial park, farm block, or rural area. More details on the tax incentives can be reviewed [here](#).

<sup>43</sup> The Renewable Energy and Energy Efficiency Partnership (REEEP) develops innovative, efficient financing mechanisms to advance market readiness for clean energy services in low- and middle-income countries. REEEP designs and implements tailor-made financing mechanisms, utilizing targeted injections of public funding to build dynamic, sustainable markets and ultimately make clean energy and energy efficiency technology accessible and affordable to all.

<sup>44</sup> 1 \$USD = 17.404 ZMW. Retrieved from: Currency world. (2023). US Dollar to Zambian Kwacha ZMW. [https://currency.world/exchange\\_rates/USD/ZMW](https://currency.world/exchange_rates/USD/ZMW)

<sup>45</sup> It is important to note that these customers might not reflect the entirety of ECS customers, especially those opting for the subscription model for their stoves. The subscription model caters to those who find 1-time payments challenging, suggesting that subscription-based customers may be at a slightly lower economic tier compared to those making outright purchases.

<sup>46</sup> Supamoto. (2023). Renewable home energy for Zambia. <https://www.supamoto.co.zm/>



The Care Economy  
Knowledge Hub



**IDRC • CRDI**

International Development Research Centre  
Centre de recherches pour le développement international



**Busara**

**Canada**



SAGANA



**OPEN SOCIETY  
FOUNDATIONS**



**intellecap**

AAVISHKAAR GROUP

**COREWOMAN**