Building the Business Case for Women's Inclusive Financing in Last-Mile Renewable Energy Markets in Sub-Saharan Africa

RESEARCH REPORT | OCTOBER 2022

Prepared for

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Mobilising Renewable Energy Investments

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ENERGIA, the International Network on Gender and Sustainable Energy, is recognized globally as a thought leader and a powerful voice in advancing global and national agendas for a more gender-inclusive energy sector. Over the past 25 years, it has contributed to the recognition of gender and energy issues as being intrinsic to inclusive development; supported gender-inclusive policies; tested implementation solutions; built capacities; built partnerships and a constituency; and generated knowledge and communication materials. These efforts are all geared towards creating a more gender-equal energy sector. For more information, visit: www.energia.org.

This research was supported by GET.invest. GET.invest is a European programme which supports investments in renewable energy. The programme targets private sector business and project developers, financiers and regulators to build sustainable energy markets in partner countries. Services include market information, a funding database, matchmaking events and access-to-finance advisory. Since 2022, GET.invest powers the Team Europe One Stop Shop for Green Energy Investments, an access point for information about and facilitated access to European support and financing instruments for energy projects and companies in Africa. The programme is supported by the European Union, Germany, Sweden, the Netherlands, and Austria, and works closely with initiatives and business associations in the energy sector. For more information, visit: https://www.get-invest.eu/.

About Distill Inclusion: Distill Inclusion is a women-led management consultancy firm based in Sub-Saharan Africa that enables stakeholders in the energy, water, transport, and climate change sectors to think practically about issues of gender equality and social inclusion challenges and opportunities. We have a range of specialists available to work with you on designing innovative approaches and spearheading research, including data collection, capacity building and training, project implementation, monitoring and evaluation, and knowledge development. We aim to help you gain clarity in your gender and social inclusion journey.

For more information

https://www.distillinclusion.com/

List of Abbreviations

ADBL	Agricultural Development Bank Limited
CRT/N	Centre for Rural Technology, Nepal
IEA	International Energy Agency
IFC	International Finance Corporation
DFF	Distributor Finance Fund
EBRD	European Bank for Reconstruction and Development
FSP	Financial services provider
GAP	Gender action plan
GLI	Gender-lens investment
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ICS	Improved cookstoves
KII	Key informant interviews
MFIs	Microfinance institutions
NFS	Non-financial services
OECD	Organization for Economic Cooperation and Development
OGS	Off-grid solar
PAYGO	Pay-as-you-go
PUE	Productive use of energy
ROI	Return on investment
SHS	Solar home system
WEDP	Women's Entrepreneurship Development Project
USAID	U.S. Agency for International Development
WEE	Women's economic empowerment
WFID	Women's Financial Inclusion Data Partnership
WMSEs	Women-owned/-led micro and small enterprises
WMSME	Women-owned/-led micro, small, and medium enterprises
WSME	Women-owned/-led small and medium enterprises

Glossary

Ecosystem Constraints for WMSME financing	The rules, regulations, and external factors like funding, financial market dynamics, and gender norms that govern or influence the supply and demand for financial services of and to WMSMEs.
Demand Side for Financing WMSMEs	The factors that influence the demand for financial services by WMSMEs. Demand side studies focus on the financial needs and preferences of WMSMEs, gathering data on women-owned and -led enterprise behaviors and the drivers of these behaviors, and examining the social and cultural expectations that prescribe what women can and cannot do in the household, community, and economy. In addition, they look at how regulatory or supply-side constraints can explain these behaviors[1]. Examples of demand side constraints include lack of financial or digital literacy, lack of trust or information, etc.
Gender-Inclusive Financing	The supply and delivery of financial products and services that address the preferences, needs, and constraints of women and men customers. Sometimes referred to as gender-smart or gender-responsive.
Renewable Energy (RE) Products	Technologies for enterprise and individual consumers that reduce energy consumption or rely on renewable energy sources. Examples include off-grid solar products, improved cookstoves, liquified petroleum gas and bio-digesters.
Women-Owned Enterprise	Using the IFC definition, an enterprise qualifies as a woman-owned enterprise if it meets the following criteria: (a) ≥ 51% owned by woman/women; or (b) ≥ 20% owned by woman/women; and (i) has ≥ 1 woman as CEO/COO/President/Vice President; AND (ii) has ≥ 30% of the board of directors composed of women, where a board exists.
Micro, Small, and Medium Enterprises	Enterprises can be differentiated according to size based on three criteria: number of employees, total assets, and annual sales. Using the IFC criteria, micro enterprises have fewer than 10 employees, total assets of less than USD$100,000, and annual sales of less than $100,000; small enterprises have 10 to 49 employees, total assets up to $3 million, and annual sales up to $3 million; and medium-sized enterprises have 50 to 300 employees, $3 million to $15 million in total assets, and up to $15 million in annual sales.
Last-Mile Distribution Renewable Energy Sector	The last leg of the distribution of goods or services to final consumers in the RE sector.

1 Singh, Nisha. "A Collaborative Effort to Diagnose the Effect of Social Norms on Women's Financial Inclusion." FinEquity Blog. 2021. https://www.findevgateway.org/finequity/blog/2021/04/collaborative-effort-diagnose-effect-social-norms-womens-financial-inclusion?sfw=pass1664032562

Off-Grid Solar (OGS)	An electricity supply that is not connected to a central grid system. It includes mini-grid systems and stand-alone technologies. OGS stand-alone technologies for households can be classified into three major categories: pico (compact, lightweight solar photovoltaic panels to generate just a few watts of power in a wide range of small and portable applications), solar home systems, and appliances.[2]
Productive Use of Energy	Using electricity to generate income (in formal and informal enterprises, both from home and in enterprise locations), including farm and non-farm income generation. Examples include pumping water for agriculture, agro-processing, lighting, information and cold chain storage.[3]
Supply Side for Financing WMSMEs	Refers to the factors that influence the supply of access to and use of financial products and services by WMSMEs. These may include laws that govern account registration, property ownership, documentation barriers, lack of customer research or suitable products, or institutional bias.

2 World Bank and GOGLA, The 2020 Global Off-Grid Solar Market Trends Report. Washington, DC. 2020. https://www.lightingglobal.org/wp-content/uploads/2020/03/VIVID%20OCA_2020_Off_Grid_Solar_Market_Trends_Report_Full_High.pdf

3 Pueyo, A. "A Gender Approach to the Promotion of Productive Uses of Electricity." IDS Policy Briefing 162. 2019.

Photo: Joost Bastmeijer/ENERGIA

Executive Summary

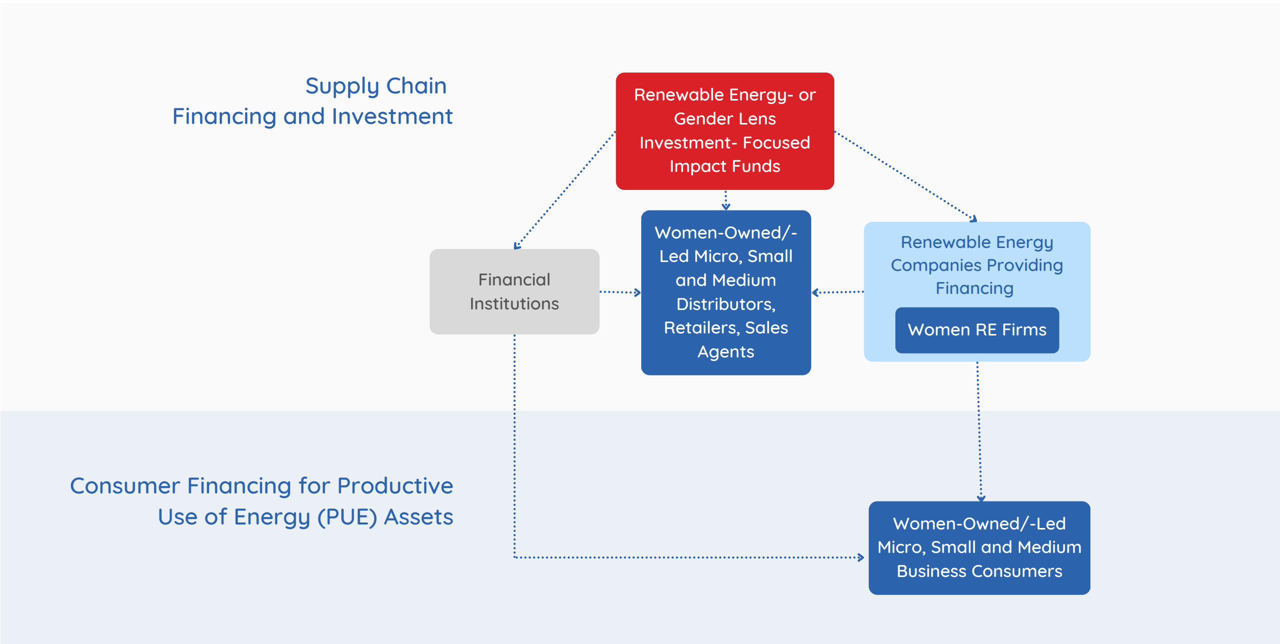
The case for expanding energy access is clear. Globally, 13 percent of the world's population lacks electricity. Access to clean energy is not only connected to increased sustainable economic growth, but it also is key to improving human health and well-being and enhancing the lives of women and children. The development and expansion of the renewable energy (RE) sector, especially the off-grid solar (OGS) sector,[4] has been critical to reducing this gap. Ensuring that women have greater voice in the sector is key to finding better energy solutions for the world's poorest. This includes improving women's participation in senior management and employment, as well as increasing women's sector participation as distributors, sales agents, and end consumers.

One of the key constraints in improving energy access in the renewable energy sector is the availability and affordability of financing. For women-owned or -led micro, small, or medium enterprises (WMSMEs) that are either selling or distributing renewable energy products themselves, or interested in purchasing renewable energy products to expand or grow their businesses, there are several different potential sources of financing, including: (1) renewable energy– or gender lens investment–focused impact funds; (2) financial service providers (FSPs), including banks,

4 Focus is placed on the renewable energy sector, specifically the OGS sector. At times, the report will refer to renewable energy with the intention of focusing mainly on OGS.

microfinance institutions, cooperatives, and fintech companies; (3) renewable energy product companies that have developed their own consumer financing; (4) crowdfunding platforms, like KIVA and Energise Africa; and (5) grant or challenge fund programs supporting women entrepreneurs. For purposes of this report, the analysis will investigate the demand and supply of financial products and services provided by a select group of financiers to the RE sector, as seen in Figure 1 below, which excludes crowdfunding platforms, grants and challenge funds since they are not a commercially sustainable or scalable sources of funding and do not have conventional financial products and services that can be refined/modified to support WMSMEs.

Figure 1: Targeted Financiers Serving WMSMEs in Renewable Energy Value Chain



With few exceptions, traditional banks in Sub-Saharan Africa have not been active in developing tailored solutions for supply chain or consumer financing for OGS, clean cookstove technologies and productive use of energy (PUE) assets. The limited number of tailored financing options for RE distributors and retailers has meant that many have had to rely on traditional business loan products offered by banks or microfinance institutions (MFIs) or on business profits to fund their working capital needs. For the former, these products offer have stringent collateral or documentation requirements. Because debt financing offered by renewable energy impact funds is often focused on larger-sized firms with long-established track records and larger minimum ticket sizes, many MSMEs are unable to access this type of funding. To address some of the consumer financing gap left by these financial institutions, many RE companies have become financiers of last resort, promoting uptake of renewable energy technologies and productive use of energy (PUE) products by offering pay-as-you-go (PAYGO) and lease-to-own payment plans for their individual and enterprise customers. However, it is not clear whether these consumer financing options are sufficient to meet demand from women or women enterprise customers.

According to recent estimates in Sub-Saharan Africa, WMSEs had a financing gap of USD $8 billion, while WSMEs had a financing gap of USD $42 billion. Although not yet quantified, there is likely to be a similar and sizable financing gap for WMSMEs in the renewable energy sector, especially given an already restrictive and reduced pool of funding options. Furthermore, women-owned MSMEs were disproportionately impacted during the COVID crisis, with higher rates of business closures and decreased profitability.[5] Given COVID's outsized negative business impact on WMSMEs, building the business case for financiers to provide more gender-inclusive products and services by recognizing gender differences in access and delivery is even more crucial.

The Distill Inclusion team conducted a literature review and key informant interviews with a variety of stakeholders in the sector, including women-owned/-led businesses, financiers, donors, international development organizations, and business associations to better understand the state of WMSME finance in the sector and the business case for serving this important market. Initially intended to highlight best practices and successful case studies for gender-inclusive WMSME finance, due to a lack of available examples the research findings instead highlight several gaps and opportunities to sustainably scale financial services for WMSME customers and supply chain actors. The research also examines the macroeconomic or ecosystem factors that may be limiting investment in financing models adapted to serve WMSMEs in the sector.

The following main gaps highlighted in the research present an interesting and important opportunity in the sector to pilot-test and adapt approaches to better serve WMSMEs:

- Lack of data about a potential financing gap for WMSMEs involved in the OGS or cookstove supply chains as distributors, retailers, or end consumers.
- Lack of examples of financiers or RE interventions focused on women's entrepreneurship that are employing customer segmentation strategies or performing ample customer research to better understand WMSME financing needs, constraints, and/or uptake of financial services.
- Lack of scalable or replicable examples of financiers or traditional financial institutions or impact funds that are refining their offerings to be more responsive to the needs and challenges of WMSMEs.

The structure of this paper is organized as follows: Section II providing information about the background and context of the challenge; Section III discussing research methodology, targeted customer segments, and data limitations; Section IV presenting the framework for the analysis, which includes examining challenges and opportunities for delivering financial services to WMSMEs on three levels—ecosystem, demand side, and supply side; Section V addressing considerations in enabling gender-inclusive financing for the WMSME ecosystem; Section VI discussing WMSME demand for financial and non-financial services and barriers to entry; and Section VII considering the supply side of WMSME finance, including gender-integrated business strategies and portfolio analysis. Section VIIIII presents case studies that address the specific

5 Lauren Braniff. Preparing MSMEs for Future Crises: Lessons From COVID-19. Center for Financial Inclusion and ACCION. 2022. https://content.centerforfinancialinclusion.org/wp-content/uploads/sites/2/2022/09/Preparing-MSMEs-for-Future-Crises-Lessons-From-COVID-19-1.pdf

constraints and considerations from the previous sections, with a special focus on examples from inside and outside of the sector. Finally, Section IX offers Recommendations and Conclusion for Donors, Practitioners, Financiers, and for future investment in and development of WMSME financing in the sector.

Ecosystem Constraints and Opportunities. Understanding the financing ecosystem for the RE sector and for MSMEs in sub-Saharan Africa is an important part of the puzzle of why financial services providers, impact funds, and financiers have not invested substantial resources to refine financial products and strategies for WMSMEs. Within the research, the Distill Inclusion team identified two main challenges that may be preventing innovation: (1) insufficient capital flows to the RE sector and a dearth of patient capital for financiers, and (2) the lack of competition in financial markets. The first challenge indicates that financiers have either scarce resources to invest in customer research or product development, resulting in a one-size fits all financing approach, or high pressure to deliver immediate returns, preventing them from exploring the potential of a seemingly difficult WMSME target segment. The second challenge highlights an overabundance of demand for financing in certain markets, meaning that financial services providers (FSPs) lack incentives to innovate or serve new target customers like WMSMEs, which they believe less likely to achieve success. Consequently, there are several opportunities to encourage improvements in the RE financing ecosystem, including:

- Gender-lens-investment donors and impact funds should continue to support initiatives to incentivize additional commercial capital flows to the sector, including de-risking investments (guarantees, securitization of accounts receivable, foreign exchange hedging), especially to support businesses or initiatives that demonstrate a commitment to customer centricity and more gender-inclusive business models.
- Donors, DFIs, and IFIs should use credit guarantee facilities, coupled with technical assistance to FSPs and other financiers, to increase the flow of capital to WMSMEs, while also building their capacity to collect, analyze, and leverage data to refine WMSME financing.
- Impact funds should request sex-disaggregated data on financing portfolios from their investees, especially PAYGo companies, to determine if gender gaps exist.

Demand Side Constraints and Opportunities. On the demand side, a lack of understanding about WMSME preferences, reasons for self-exclusion and gender-specific constraints may be preventing female-owned/-led enterprises from accessing the capital they need. For example, many of the WMSMEs interviewed preferred bootstrapping to finance the start-up or the growth of the business, citing high interest rates, restrictive requirements from FSPs, as well as gender bias in the sector. Mismatches in WMSME financing needs and financing deal sizes were also identified as barriers for women-led enterprises. Opportunities at this level include the following:

- Donors and impact investors should support financiers and interventions to conduct customer research for specific segments of WMSMEs to determine the adjustments to credit offerings needed to make them more attractive to WMSMEs—longer repayment periods, more flexible repayment schedules, non-financial service support, different outreach channels, etc.

- Donors, impact investors, and international development organizations should encourage financiers and programs to examine how unit economics for different subsectors may impact the feasibility of certain interest rate offerings, to determine if refinements are needed.
- Donors, industry associations, and impact investors should support further research into PAYGo financing for women and sex-disaggregated data, identifying barriers to adoption to encourage refinement of offerings or adoption of customer segmentation strategies.

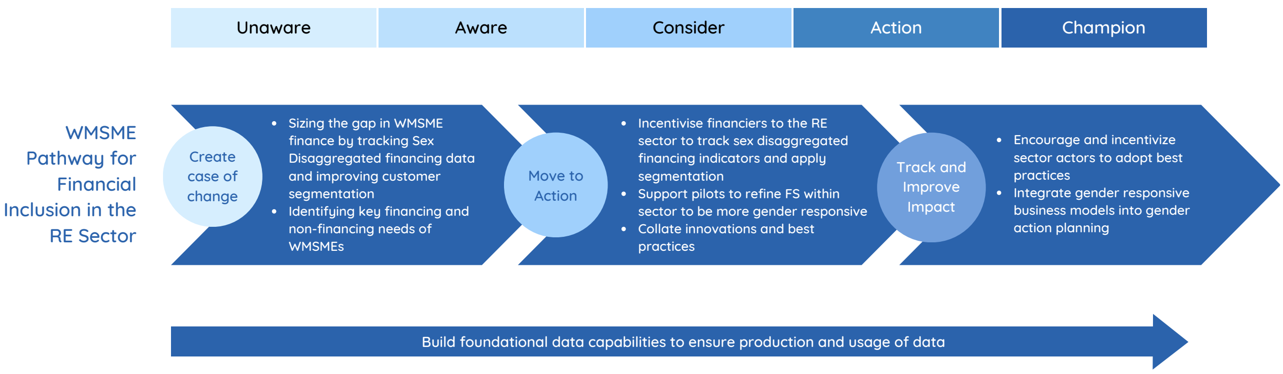
Supply Side Constraints and Opportunities. The research team discovered several trends that may be impeding efforts to modify, adapt, or redesign financial products for WMSMEs in the RE sector. Regarding WMSMEs that are interested in PUE asset financing, a lack of sex-disaggregated portfolio data by PAYGo or other financiers suggests that the sector may not yet understand the consumer financing gap for WMSMEs, even when their impact fund investors are increasingly focused on gender impact. Coupled with a lack of customer segmentation for enterprise clients by financiers or for MSMEs in the RE sector by FSPs, it is difficult to better elaborate the business case for why all finance actors should further refine financial offerings to serve this target. This has been exacerbated by business disruptions from COVID-19, since more revenue-constrained financiers tend to deprioritize gender investments because they do not believe them to be integral to their business survival. Among the few OGS and cookstove supply chain–focused financing facilities, there has not been any research to understand why WMSMEs are not well represented. Is it because they are fewer in number or if their lack of representation is due to difficulties in outreach or restrictive requirements. Opportunities at the supply side level include the following:

- Financiers to the RE sector should collect and analyze sex-disaggregated financing data to (1) determine if there is a significant gender-financing gap in their portfolios that should be addressed, and (2) create profiles for existing WMSME clients, using them to target customer outreach.
- Donors, impact funds, and INGOs should support financiers and FSPs to pilot-test segmented approaches to WMSME financing for PUE and for supply chain financing.
- Donors, impact funds, and INGOs should support pilot-testing the bundling of financial and non-financial service offerings for WMSMEs in the sector, helping financiers to examine business performance benefits.
- Donors and impact funds should provide financial support and technical assistance for financiers to perform in-depth customer research to segment WMSMEs to improve their sales and credit, as well as non-financial services support strategies to identify and target WMSMEs most likely to benefit from PUE asset investments.
- Women's entrepreneurship or economic empowerment initiatives, especially those with access to finance components via financial institution linkage, should utilize customer segmentation to ensure sufficient WMSME interest in formal financing and that participants meet eligibility criteria when credit products are not able to be refined.

Conclusion. Overall, the report aims to add to the RE sector's understanding of WMSMEs as both supply chain actors and end consumers of PUE assets, moving beyond thinking of women as a monolithic customer segment to acknowledging their diverse needs and constraints. The persona profiles, herein, provide some information about the specific needs, constraints and perceptions of women-owned or led micro, small and medium enterprises. On the supply side, there are many reasons why the supply of financing in the RE sector may not be responsive to the specific needs of different WMSME segments. Ranging from a lack of sex-disaggregated portfolio data by financiers to a lack of segmentation by FSPs for the RE sector, these data gaps make it difficult to define the extent of the problem. Adoption of 2X Challenge criteria has resulted in RE firms and financiers improving internal policies and procedures to create the framework for a more gender-balanced sector. However, more is needed. How these actors choose to finance their customers and supply chain partners dictates whether WMSMEs are able to participate or are interested in doing so.

As seen in Figure 2, the Women's Financial Inclusion Data Partnership (WFID) women's financial inclusion pathway for change is a useful tool for conceptualizing how the renewable energy sector can create the case for change. The RE sector is currently in the building awareness phase and creating the case for change. By highlighting the gaps and opportunities in the financing ecosystem and the supply of financing for WMSMEs in the sector, this report hopes to inspire additional funding and technical assistance from donors, investors, and RE sector support organizations to better incentivize financiers to move into the action phase of testing and refining financing and business models that meet the needs of different WMSME segments.

Figure 2: WMSMEs in RE Financial Inclusion Pathway



Adapted from the WFID's Theory of Change for Women's Financial Inclusion.[6]

6 2X. "The Way Forward: How Data Can Propel Full Financial Inclusion for Women." Women's Financial Inclusion Data Partnership. 2019. https://data2x.org/wp-content/uploads/2019/08/The_Way_Forward.pdf

Importantly, if financiers do not make the connection that expanding their product lines and services to increase the participation of WMSMEs is critical to their bottom line, progress on internal gender policies and procedures that were inspired by the 2X Challenge criteria may languish. As the sector progresses into the action phase, donors and impact funds have an opportunity to support investees in advancing beyond adjusting internal policies and procedures in step with 2X Challenge principles. The intention of this report is to identify areas where donors and impact funds can support investees in quantifying and recognizing where gender gaps in financing exist and to understand how being responsive to gender differences can in fact contribute to business bottom lines. They can encourage the various financiers in the OGS and cookstove sectors to identify and investigate financing gaps for WMSMEs and use these data to pilot-test refinements in business and financing models. Although not all WMSMEs will be considered as viable or profitable clients by financiers at first, a growing evidence base will help articulate the business case. As seen in the women's financial inclusion sector, once financiers recognize that certain WMSME segments are viable and profitable, they will be more interested in developing additional non-financial services or women's entrepreneurship programming to support the expansion of these segments.

II Background and Context

Approximately 13 percent of the world's population is currently living without access to electricity, and almost all of these people live in rural areas in low- or middle-income countries. Overall, the number of people without access to electricity in Africa in 2021 is estimated to have risen by 4 percent from before the pandemic to reach nearly 600 million.[7] In order to reach SDG 7 by 2030, more than $7 billion USD will need to be invested in the alternative energy sources of solar, wind, and thermal power. Access to clean energy is not only connected to increased sustainable economic growth, but it also is key to improving human health and well-being and enhancing the lives of women and children.[8] According to Marie-José Nadeau, the former chair of the World Energy Council, "[T]here is a clear link between finding better energy solutions for the world's poorest and having more female participation in the energy sector.... [I]f we are to find the solutions for a sustainable energy future, then there must be a diversity of voices, and that includes women."[9]

7 International Energy Agency. August 25, 2022. https://www.iea.org/topics/energy-access
8 NCE. "Unlocking the Inclusive Growth Story of the 21st Century: Accelerating Climate Action in Urgent Times." A Report of the Global Commission on the Economy and Climate. 2018; and UN. "Sustainable Energy 'Golden Thread' Linking 2030 Agenda with Pledge to Leave No One Behind, Especially Rural Women, Deputy Secretary-General Tells Side Event." Press Release. July 16, 2018.
9 EEP Africa. "The Power of Clean Energy for Women." World Energy Stories. August 30, 2022. https://www.worldenergy.org/world-energy-community/world-energy-stories/entry/eep-africa-the-power-of-clean-energy-for-women

This includes ensuring that women can reap the benefits of these development outcomes by exploring avenues to increase income from their existing enterprises, specifically by providing access to skills learning and other educational opportunities in the energy sector, and ensuring energy technologies help reduce their drudgery and time-poverty. **Consequently, women-led micro, small, and medium enterprises (WMSMEs) are a driving force behind achieving energy access objectives.**

One of the key constraints in improving energy access in the renewable energy sector, particularly in the off-grid solar (OGS)[10] sector is the availability and affordability of financing.[11] IFC estimates the gender financing gap for women-owned or led micro enterprises in Sub-Saharan Africa to be USD $8 billion, and for small and medium enterprises $42 billion.[12] Much work has been done by global initiatives to accelerate the closure of gender gaps in female entrepreneurship and financial access in the renewable energy sector. However, women are still underrepresented and gain less from projects and programs. Initiatives taken by stakeholders—such as the 2XCollaborative, ENERGIA, the World Bank's Energy Sector Management Assistance Program (ESMAP), GET.invest, the Shell Foundation, Barefoot College International, GOGLA, CGAP, the Alliance for Financial Inclusion, Data 2X, Women's Financial Inclusion Data Partnership GIZ, Bill and Melinda Gates Foundation, Financial Sector Deepening programs, the Center for Financial Inclusion, and others—are strengthening the business case for enhancing gender equality. There is also a role for private sector actors, which can unleash significant economic opportunities while realizing empowerment and equity goals by incorporating more inclusive actions at all levels of the renewable energy value chain. Though the financing gap for renewable energy WMSMEs has not been quantified, existing data from the most recent Global Findex and IFC Global Overview for MSMEs suggest that women-owned and -led enterprises still lag behind their male counterparts in accessing the capital they need for growth. To this end, gender-inclusive financing that requires providers to consider women's needs, challenges, and contexts when designing the specific terms, conditions, and delivery models, will be critical for the expansion of financial services to WMSMEs.[13] However, it does not necessarily require the development of new financial products that only target women. **By integrating a gender lens across their work with entrepreneurs, employees, and customers, renewable energy businesses and financial service providers can achieve market growth, better product uptake, and enhanced consumer satisfaction.**

10 Focus is placed on the renewable energy sector, specifically the OGS sector. At times, the report will refer to renewable energy with the intention of mainly focusing on OGS.

11 World Bank. "Funding the Sun: New Paradigms for Financing Off-Grid Solar Companies." Washington, DC. 2020. https://documents1.worldbank.org/curated/en/447971581689878643/pdf/Funding-the-Sun-New-Paradigms-for-Financing-Off-Grid-Solar-Companies.pdf

12 International Finance Corporation. "MSME Finance Gap: Assessment of the Shortfalls and Opportunities in Financing Micro, Small, and Medium Enterprises in Emerging Markets." 2017. Washington, DC.: International Finance Corporation. https://openknowledge.worldbank.org/handle/10986/28881

13 Investment Climate Reform Facility. "Trends in Gender Mainstreaming in Africa Caribbean Pacific (ACP) Development Finance Institutions." ICReport. 2022.

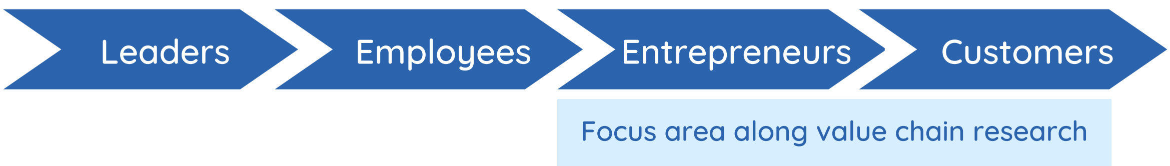
A. Importance of Women in the Renewable Energy Sector

Gender gaps in renewable energy value chains

Compared to other sectors, the energy sector has large gender gaps in women's leadership, employment in the sector, entrepreneurship, and customer reach. According to 60_decibels most recent September 2022 Off-Grid Energy Benchmarks, female customer reach for the sector stands at 29 percent.[14] Closing these gaps will be vital as women are key drivers of innovative and inclusive solutions across renewable energy value chains (see Figure 3 below). Despite making up 48 percent of the global labor force, women account for only 22 percent of the traditional energy sector. At management levels, the percentage of female leaders is low. An OECD/IEA analysis of data from approximately 2,500 firms in energy-related sectors shows that women comprise just under 14 percent of senior managers, with representation strongest in the utility sector (17.1 percent). Excluding utilities, women hold less than 12 percent of leadership roles, compared with 15.5 percent of the 30,000 non-energy firms in the analysis. Renewable energy firms are below the average in terms of female leadership, with women holding just 10.8 percent of senior roles.

Gender gaps also exist in the number of female entrepreneurs receiving funding. The needs of women as end-users are rarely addressed by project developers and financiers, despite the multiple development benefits that could be achieved through meeting those needs. Recent research by Efficiency for Access finds that the lighting and appliances sector still mainly serving a homogenous demographic that is male, better educated and more affluent than the average person in his country; and that 84 percent of companies do not report gender-disaggregated data.[15] In addition, only 18 percent of the funding under the 2XCollaborative has focused on enabling women's social empowerment through products and services, such as access to finance.[16] The lack of focus on customer needs has knock-on effects on RE product adoption, and risks widening the productivity gaps that exist already e.g. the gender gap per unit of cultivated land—ranges from 4 to 25 percent, depending on the country and the crop.[17]

Figure 3: Women's Participation Along Renewable Energy Value Chains



14 60_decibels Off-Grid Energy Benchmarks, September 2022. https://pages.60decibels.com/energy-benchmarks

15 Efficiency for Access. Appliances for All: Assessing the Inclusivity of the Solar Appliances and Lighting Sector. 2022. https://storage.googleapis.com/e4a-website-assets/Appliances-for-All-Assessing-the-Inclusivity-of-the-Solar-Lighting-and-Appliances-Sector.pdf

16 Power for All. Shining the Light on Women! 2022. https://www.powerforall.org/insights/impact/shining-light-women

17 World Bank. ONE Campaign. "Levelling the Field: Improving Opportunities for Women Farmers in Africa." 2014. https://openknowledge.worldbank.org/handle/10986/17790

Snapshot of women entrepreneurs globally and opportunities in the energy sector

The GEM 2020/2021 Women's Entrepreneurship Report showed that women's entrepreneurship is fundamental to promoting inclusive economic growth in developing economies, with women entrepreneurs representing about one in three growth-oriented entrepreneurs active in the world today.[18] In low- and middle-income countries, 17 percent of women are entrepreneurs and 35 percent aim to become entrepreneurs. This means that over half of women in developing countries see entrepreneurship as a path to a better future for themselves and their families, compared to only 25 percent in high-income countries. According to most recent estimates, while Sub-Saharan Africa has the world's highest rate of women entrepreneurs with 26 percent of the adult female population involved in business activities[19], it represents 17 percent of the global WMSME financing gap.[20] The Mastercard Index of Women Entrepreneurs (MIWE) 2021 found that Botswana, South Africa, and Ghana are among the countries with the highest percentage of women entrepreneurs globally,[21, 22] with a large majority of them being young women, given that 70 percent of the population in Africa is under the age of 30.

Women-led businesses are an important vehicle for enhancing women's economic opportunities and agency, and research has shown how they contribute significantly to poverty reduction and economic growth.[23] There is a burgeoning amount of scholarship highlighting the structural barriers that prevent women from scaling their enterprises by limiting their access to the financial, physical, human, and social capital required to succeed. These challenges are even more pronounced for young women who often have low self-esteem and less education as a result of gender norms. Women are more likely to be solopreneurs.[24] And, on average, women-led micro, small, and medium enterprises (WMSMEs) have fewer employees than their male counterparts. Approximately 70 percent of the world's WMSMEs do not have access to financing or lack the amount of financing needed to grow.[25] The COVID crisis has further highlighted the importance of addressing financial access and usage gaps for WMSMEs. An analysis published in April 2021 by Oxfam estimates that the crisis cost women around the world at least $800 billion USD in lost income in 2020, comparable to more than the combined GDP of 98 countries. As several initiatives and institutions have pivoted to implement gender-inclusive financing in response to the COVID-19 crisis to foster resilience and business sustainability, there is an opportunity to share best practices, lessons learned, successful business models, current gaps, and entry points to inform the business case for financiers interested in serving WMSMEs.

18 GEM (Global Entrepreneurship Monitor), "Global Entrepreneurship Monitor 2021/22 Women's Entrepreneurship Report: From Crisis to Opportunity." London: GEM https://www.gemconsortium.org/report/gem-202021-womens-entrepreneurship-report-thriving-through-crisis

19 GEM. "Women's Entrepreneurship 2016/2017 Report" Boston: GEM https://www.gemconsortium.org/report/gem-20162017-womens-entrepreneurship-report

20 International Finance Corporation "MSME Finance Gap: Assessment of the Shortfalls and Opportunities in Financing Micro, Small and Medium Enterprises in Emerging Markets" 2017. Washington, D.C.: International Finance Corporation. https://openknowledge.worldbank.org/handle/10986/28881

21 Index focuses on how women in business are progressing across 58 global economies. It is a composite measure of female-led enterprises including small business owner, business founder, and self-employed.

22 Mastercard. "The Mastercard Index of Women Entrepreneurs (MIWE)." 2021.

23 OECD. "Enhancing Women's Economic Empowerment through Entrepreneurship and Business Leadership in OECD Countries." 2014. https://www.oecd.org/gender/Enhancing%20Women%20Economic%20Empowerment_Fin_1_Oct_2014.pdf

24 A person who sets up and runs a business of their own.

25 SME Finance Forum. "MSME Finance Gap." Accessed September 14, 2022. https://www.smefinanceforum.org/data-sites/msme-finance-gap

There are various challenges in the RE sector including high transaction cost of operations. In addition, RE distributors struggle to raise money, particularly working capital for inventory and consumer financing.[26] Lack of data on the key characteristics of women-owned enterprises and potential for productive uses of energy makes it difficult to attract women customers, as well as design business strategies and projects that could transform economic opportunities for women.[27] Lack of sex-disaggregated data about customer segments and demand for products leads to missed opportunities to reach key women customers.

Women's entrepreneurship within the energy sector has the potential to significantly enhance economic growth and promote social inclusion and empowerment. Women-led enterprises tend to have a stronger emphasis on social value.[28] Increasing women's participation in the energy sector workforce and their access to energy products and services is key to deliver on both access goals and women's economic empowerment objectives. Women are also more easily able to reach out to and interact with female end-users, especially in situations where women are primary users and in areas where cultural and social norms inhibit public engagement with women.[29] **By failing to acknowledge that women's financial needs, behaviors, and capabilities are different than men's, many FSPs and the selected financiers that this report addresses have been largely gender unaware when designing and delivering financing, resulting in women's continued exclusion.**[30]

ENERGIA and others have documented the myriad reasons why banks and other non-traditional FSPs do not adequately serve women and WMSMEs in the renewable energy sector. These include, but are not limited to, misperceptions of risk, lack of familiarity with the renewable energy sector, lack of awareness of barriers to entry for women, and failure to tailor financial product offerings to meet the needs of different female customer segments or the different stages of WMSMEs. Articulating the business case for a wide variety of actors, including FSPs, investors, and selected financiers in the renewable energy sector, to better serve WMSMEs in the energy sector should be an iterative and tailored process. For example, in less competitive markets, financiers may not feel compelled to transform their institutions to become more gender responsive solely by the promise of improving customer value propositions and customer retention, expanding customer bases, or increasing average product used per customer. In these cases, donors and renewable energy– and financial inclusion–minded investors may have a greater role to play by incentivizing these changes.

26 Dutta, Soma. "Supporting Last Mile Women Energy Entrepreneurs: What Works and What Does Not." ENERGIA, the International Network on Gender and Sustainable Energy. 2018. https://www.energia.org/assets/2019/01/Supporting-Last-Mile-Women-Entrepreneurs.pdf

27 ENERGIA. "Women's Energy Entrepreneurship: A Guiding Framework and Systematic Literature Review." 2019. https://www.energia.org/assets/2020/02/RA7-Womens-Energy-Entrepreneurship-Evidence-Report-Final.pdf

28 Hechavarria, D. M, A. Ingram, R. Justo and S. Terjesen. 2012 "Are Women More Likely to Pursue Social and Environmental Entrepreneurship?" 2012.

29 USAID and IUCN. "Advancing Gender in the Environment: Making the Case for Women in the Energy Sector." 2018. https://www.usaid.gov/sites/default/files/2022-05/IUCN-USAID-Making_case_women_energy_sector.pdf

30 Global Banking Alliance for Women. "The Paradox of Gender-Neutral Banking." (2016) https://financialallianceforwomen.org/download/the-paradox-of-gender-neutral-banking/

As noted by Women's World Banking, "Forward thinking institutions who recognize the potential of the women's market as a business growth strategy will need to believe in gender-inclusive products as a smart business move and not just as a Corporate Social Responsibility initiative."[31] Building the business case requires an understanding that financiers to the sector will also need to continuously monitor uptake and quantify how women clients benefit their bottom line.[32] The renewable energy sector is in the early stages of recognizing these gaps, since financiers are predominantly not yet utilizing sex-disaggregated data at the individual product level or segmenting customers to examine opportunities for growth, improve the customer experience, or tailor their financial offerings to address specific customer segment needs.

B. Aim of the Research Report

While there are several recent resources that provide guidance on how to increase access to financing for WMSMEs —such as GIZ's Women's Financial Inclusion Toolkit,[33] UNCDF's Inclusive Digital Economies and Gender Equality Playbook,[34] and CGAP's *Addressing Gender Norms to Increase Financial Inclusion: Designing for Impact*[35]—**there is no one comprehensive resource that can help financial services providers and investors focused on financing women-led MSMEs in the renewable energy sector.** ENERGIA's "Supporting Last Mile Women Energy Entrepreneurs: What Works and What Does Not" has begun to catalogue innovative approaches to entrepreneurial and asset financing for women and their key factors for success. However, there is a need for systematic guidance that brings together evidence, approaches, case studies, and examples on this topic, specifically targeting financiers and investors. The research approach, outlined in Figure 4, aims to fill this gap through systematic research to inform a research report and case studies. These will be followed by a digital toolkit that will distill the research findings and connect users to relevant guidance, tools, and case studies.

31 Women's World Banking. "How to Create Financial Products That Win with Women." September 4, 2018. https://www.womensworldbanking.org/insights-and-impact/how-to-create-financial-products-that-win-with-women/
32 Ibid.
33 GIZ. "Women's Financial Inclusion Toolkit—Paving the Way for Women's Economic Empowerment." August 25, 2022. https://www.giz.de/expertise/html/62336.html
34 Harihareswara, Nandini, Anushree Deb, and Rose Payne. "Inclusive Digital Economies and Gender Equality Playbook." UN Capital Development Fund. 2021. https://www.uncdf.org/article/6875/ide-and-gender-equality-playbook
35 Koning, Antonique, Joanna Ledgerwood, and Nisha Singh. "Addressing Gender Norms to Increase Financial Inclusion: Designing for Impact." 2021. https://www.cgap.org/research/publication/addressing-gender-norms-increase-financial-inclusion-designing-impact

Figure 4: Project Overview

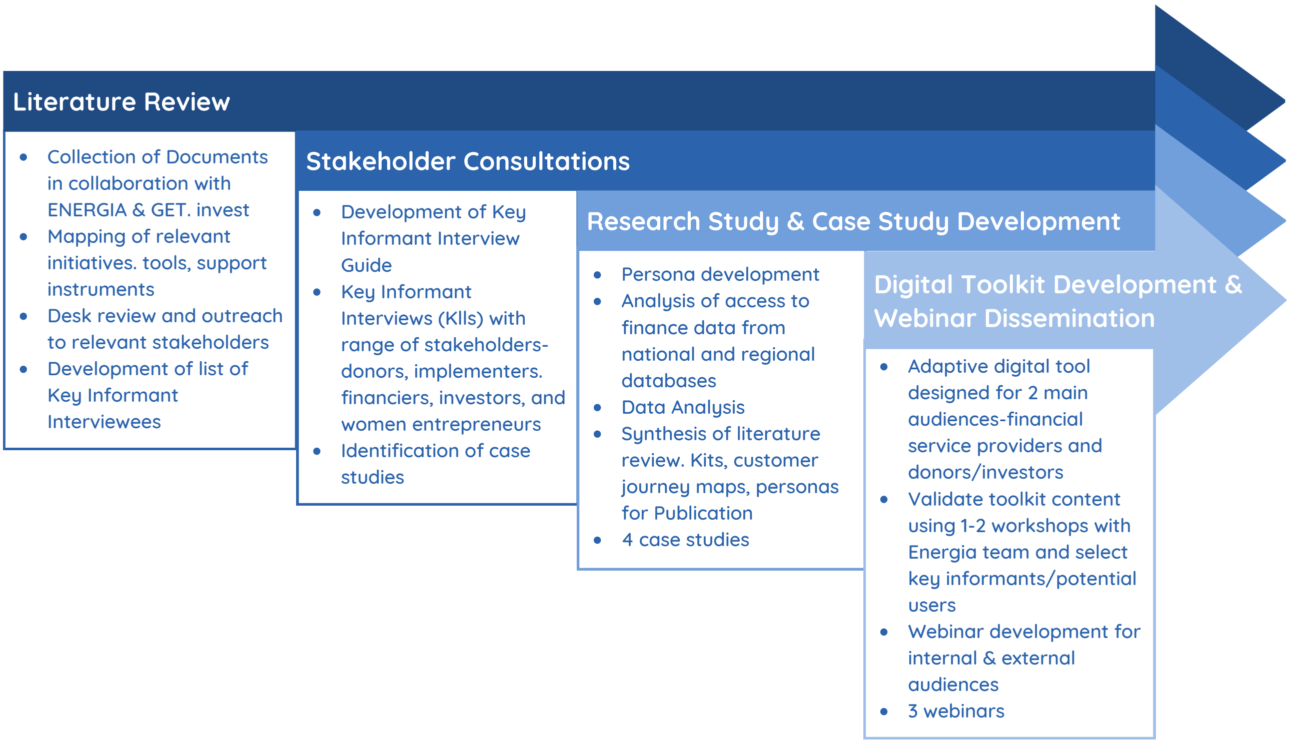


Photo: Joost Bastmeijer/ENERGIA

III Research Methodology

A. Research Goals and Target Audiences

The research report synthesizes findings from the literature review and key informant interviews (KIIs) to provide a framework on how to enable access to finance to support the growth of WMSMEs in the renewable energy sector. It identifies main themes related to key factors for success in providing gender-inclusive financial services for WMSMEs. It also includes examples of WMSME personas to demonstrate the opportunities, challenges, and financing needs of WMSMEs. This information has shaped the development of personas and two case studies that will build a foundation for the understanding of key financing needs and constraints for WMSMEs, highlight best practices from within and outside of the sector, and describe key challenges and considerations for the target audience, which includes donors, private sector renewable energy firms (in particular, those serving the "last mile"), financial-sector support organizations, financial services providers, and local and international NGOs and governments. The research report concludes with recommendations for both financial providers and investors/donors. The forthcoming digital toolkit will build upon the report and present tools, guidance, and findings in a structured and easy-to-use, digitally accessible format.

Included below is a summary of the learning objectives and the intended audiences. The research framework looked at the market challenge from three different levels:

1. Understand WMSMEs in the last-mile RE value chains: The demand for financial and non-financial services by various-stage WMSMEs in the renewable energy sector and those WMSMEs utilizing productive use of energy; highlighting gaps, needs, attitudes, and constraints.

2. Assess the needs, challenges, and successful models of financing WMSMEs in RE value chains: Supply side opportunities, constraints, and validated models for providing financial services to WMSMEs in the renewable energy sector, focusing on trends, metrics, key characteristics, and decision points for investing in gender-inclusive services.

3. Understand the complexities of financial ecosystem players, market dynamics, and decision points: The ecosystems in which financial institutions operate, including market conditions, legal regulatory frameworks, social norms, and business support services.

The following key research questions informed the research report.

Understand WMSMEs in the last mile RE value chains

- What are the gaps/needs of women-led MSMEs regarding accessing relevant & applicable finance such as credit, working capital?
- Where do women-led MSMES obtain their information about financing options?
- What types of non-financial services are in highest demand from WMSMES? Why?

Understand WMSMEs in the last-mile RE value chains

- What are the key components to successful strategies employed by organizations, financial institutions and businesses?
- If there are no successful or replicable strategies, what are the incentive gaps to encouraging further investment in refined financing strategies to serve various WMSME segments?
- How do financial institutions make decisions regarding how/when to serve new target markets?
- How have financing models like PAYGO that have been promoted as more inclusive served WMSME segments?
- What are the most important elements of the business case for FSPs successfully serving WMSMES in the sector?
- For those not active in the sector, what are the missing elements of the business case?

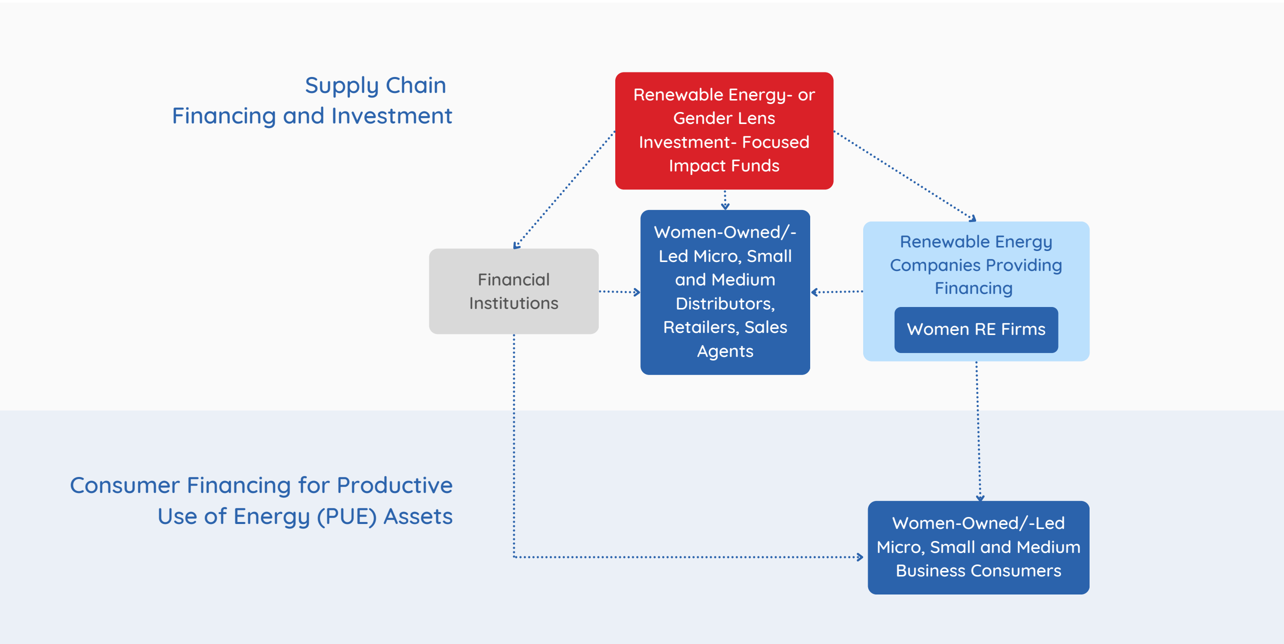
Understand the complexities of financial ecosystem players, market dynamics, and decision points

- What are the key requirements to access existing financial products? Are these requirements challenging for some, most or all WMSMEs to attain?
- Which types of financial services and support packages are needed to allow more WMSMES to participate and grow in the sector?
- Which informative case studies and practical tools can help financiers in the OGS sector to recognize the business opportunity to serving WMSMES?
- Do they include adjusting pipeline development, refining financial products or non-financial service offerings?
- Are there trends in the market conditions for successful or unsuccessful interventions/business models?

B. Targeted Financiers for WMSMEs in Renewable Energy Value Chains

There are several different potential sources of financing for women-owned or -led micro, small, or medium enterprises (WMSMEs) that are either selling or distributing renewable energy products themselves or interested in purchasing renewable energy products to expand or grow their businesses. These include: (1) renewable energy– or gender lens investment–focused impact funds; (2) financial service providers (FSPs), including banks, microfinance institutions, cooperatives, and fintech companies; (3) renewable energy product companies that have developed their own consumer financing; (4) crowdfunding platforms, like KIVA and Energise Africa; and (5) grant or challenge fund programs supporting women entrepreneurs. For purposes of this report, the analysis will investigate the demand and supply of financial products and services provided by a select group of financiers to the RE sector, as seen in Figure 5 below, which excludes crowdfunding platforms, grants and challenge funds since they are not a commercially sustainable or scalable sources of funding and do not have conventional financial products and services that can be refined/modified to support WMSMEs.

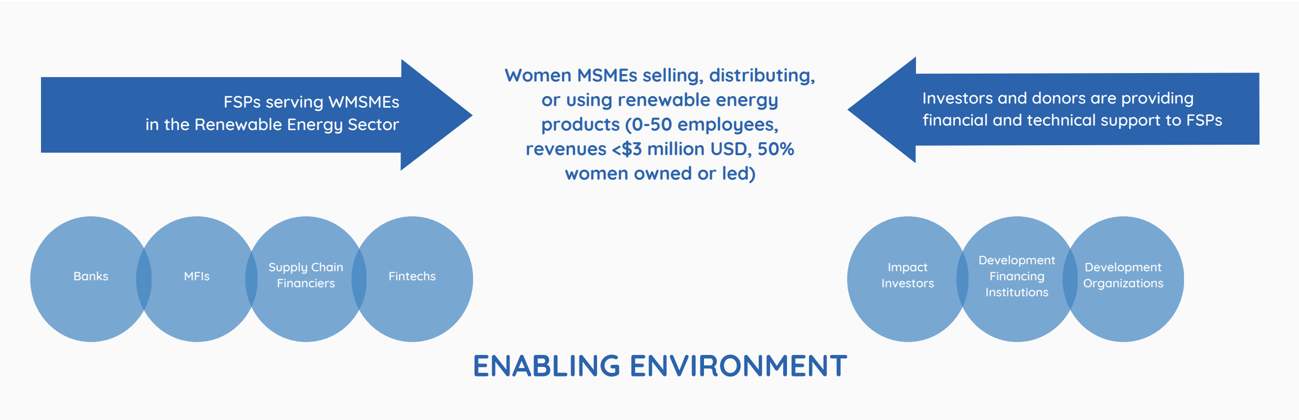
Figure 5: Targeted Financiers Serving WMSMEs in the Renewable Energy Value Chain



C. Targeted Female Customer Segments

The focus of the research report and toolkit is on micro, small, and medium enterprises (MSMEs) that are at least 50 percent women-owned or -led, with 1–50 employees and revenues of less than $3 million USD, active in the distribution or sales of renewable energy products or utilizing clean energy products to improve their production/income. For purposes of the research, renewable energy products will comprise pico solar systems, solar home systems (SHS), clean cooking products, and other clean energy products that support productive use. The two main segments of women entrepreneurial businesses addressed are women-led small and medium enterprises selling renewable technologies and those led by women micro-entrepreneurs who are either involved as last-mile distributors of renewable technologies or who are using clean energy technologies within their enterprises. As pictured in Figure 6, the research and key informant interviews looked at financing provided by banks, microfinance institutions, supply chain actors, and fintechs to the WMSME distributors, retailers, sales agents, or PUE customers, as well as those impact investment funds, development finance institutions, and international development organizations/donors that provide capital or technical assistance to WMSMEs.

Figure 6: Target Group of Women Entrepreneurs



D. Methodology Overview

A combination of qualitative and quantitative methods was used to inform the research study, case studies, and digital toolkit design. The focus of this report is on (a) investigating WMSME demand for financing in the RE sector, both as supply chain partners and consumers interested in purchasing productive use of energy (PUE) assets to improve their businesses, (b) examining ecosystem challenges that disincentivize refinements in financial models by the various actors providing financing within the sector, (c) identifying data gaps that make it difficult to articulate a strong business case for why financiers to the renewable energy sector should target WMSMEs with refined financial offerings and which WMSMEs should be targeted, (d) promoting lessons learned from inside and outside of the sector, and (e) highlighting opportunities for donors, impact funds, and international organizations to support the sector in becoming more gender responsive, especially with financial product offerings. The literature review and KIIs were selected with a specific focus on Sub-Saharan Africa, since to date it represents the largest market for RE development. To ensure that regional and contextual differences were accounted for, the team reviewed literature and interventions in East, West, and Southern Africa. Given that many of the findings in this report highlight various data gaps, lessons learned, and opportunities to improve business processes to expand financing for WMSMEs in the sector, it is expected that they will be applicable to other countries outside of SSA.

Literature Review: The literature review looked at relevant primary and secondary resources from practitioners, ENERGIA/GET.invest partners, research institutions, policymakers, thought leaders, and data platforms in the energy and financial services sectors. These resources included reports, evaluations from relevant projects and workshop reports, and national and regional level access to finance surveys. The literature review was also used to (a) populate a list of relevant stakeholders for KIIs, (b) identify gaps in existing knowledge and evidence bases, (c) develop interview questionnaires for KIIs, and (d) identify case studies for the digital toolkit.

Key Informant Interviews: Outreach was made to 41 organizations/practitioners in the financial inclusion, women's economic empowerment, and renewable energy sectors. A total of 28 semi-structured key informant interviews (KIIs) were conducted from July–August 2022. In concert with the literature review, the goal of the KIIs was to document key elements of provider approaches, customer needs, and challenges, as well as identify potential case studies, customer journeys, and personas that will be key components of the digital toolkit. Existing platforms like CGAP's FinEquity were leveraged to identify new initiatives, research studies, and partners to include in the landscape analysis.

Table 1: Summary of Semi-Structured Key Informant Interviews

Stakeholders	Summary of Stakeholers Interviewed
Investors and fund managers	• Acumen • Alitheia Capital • SIMA Angaza Distributor Finance Fund • Wangara Green Ventures
Financial services provider	• Bidhaa Sasa • Agricultural Development Bank Limited
Private sector renewable energy firms	• Ecotech Mali • Black Star Energy/Energicity • Freetown Waste Transformers • Lanforce Energy
Business support organizations	• GOGLA • Center for Rural Technology Nepal • CIDR/PAMIGA
International/local development organizations	• Energy 4 Impact • Practical Action East Africa • Clean Cooking Alliance
Donors and policymakers	• USAID Feed the Future Innovation Lab for Small Scale Irrigation • USAID POWER AFRICA • Africa Development Bank Affirmative Finance Action for Women in Africa (AFAWA initiative)
Thought leaders	• Diana International Research Institute, Babson College
Women MSMEs	• Black Star Energy/Energicity (mentioned above) • Freetown Waste Transformers (mentioned above) • Female clients of Lanforce Energy • Energy 4 Impact Foyré Rewbé 2 Project entrepreneurs

Data Analysis: Quantitative data was utilized, where possible, to support the research study findings and strengthen the business case for gender-inclusive financing for WMSMEs in the renewable energy sector. While national and regional data sets for women's financial inclusion and WMSME access to finance have helped to underline the persistent credit gap in those areas, the available data sets do not often include sector-specific data and do not consistently sex-disaggregate data across countries. However, the severe limitations of the data—lack of sex-disaggregated data, standardization of indicators, sector-specific or WMSME focus—meant that data resources needed to be used strategically to support the business case for serving WMSMEs in the target groups.

Case Studies and Personas Development: A key goal of both the desk research and the KIIs was to identify compelling case studies and create profiles for different women entrepreneurs who are the prospective target segments of this research. Drawing from examples both inside and outside of the sector, the research report includes two case studies that showcase best practices and the business case for serving WMSMEs, as well as adaptations to business and financing models that have allowed companies to better serve targeted female customers. These include:

- One composite case study about how and why financial services providers innovated to provide gender-inclusive financial services outside of the sector.
- One case study about Bidhaa Sasa, a last-mile distributor financing company selling OGS and cookstove products with a majority women client base.

Based on interviews with WMSMEs and women RE entrepreneurs, two WMSME customer profiles were developed to highlight differences in distinct WMSME segments. The Value Creator represents women entrepreneurs in medium-size enterprises who are involved in the sale and distribution of RE products. The Pragmatist, in the second profile, represents women micro-entrepreneurs who are using PUE for their businesses and contribute to family income and well-being. These profiles are intended to help financiers serving the renewable energy sector better understand the financing needs, barriers, behaviors, and preferences of each segment. They are narrative depictions of customer personas that will be used in the forthcoming digital toolkit. In the toolkit, the personas will illustrate a specific customer discovery approach that providers can use in their own work, as well as provide useful insights into the different segments.

E. Data Limitations and Gaps

There are several data limitations in this study. Despite reaching out to 41 institutions over two months, the team was able to complete only 28 interviews. As a consequence, the key trends and developments in the sector identified through interviews may not be fully representative of the sector. Noticeably absent from the canvas are financial services providers, who did not respond to requests for interviews.

The team compensated for this challenge by interviewing several thought leaders and organizations that work with different providers in the sector, including government aid agencies, impact funds, and industry associations, which confirmed the same limitations and gaps in the sector. In spite of these limitations, Section VI includes new insights provided from several different WMSME segments with respect to financing needs, challenges, and behaviors. The remaining sections present an analysis of the ecosystem and supply side challenges that are preventing greater investment in gender-inclusive financing models for WMSMEs in the RE sector.

The lack of sex-disaggregated data for financing provided by renewable energy firms, or differentiation between individual, household, and enterprise clients, made it difficult for the Distill Inclusion team to determine which financing programs, products, or models may be more successful in serving WMSMEs. This data gap spans a range of different financing entities, from renewable energy firms selling or distributing solar home systems, solar appliances, or agricultural equipment to impact or distributor financing funds. This data gap is more acute in the PAYGO solar sector. Despite massive growth in the sector over the past five years, it is not clear whether PAYGO has significantly benefited women customers since providers are not reporting sex-disaggregated data. Though promoted as a more affordable way to finance renewable energy technologies, without restrictive collateral requirements, other barriers such as the digital gender gap may be preventing women from learning or accessing PAYGO financing. Section VII unpacks further discussion of these supply side constraints and opportunities.

In the absence of sex-disaggregated financing data, the Distill Inclusion team sought data from outside of the sector. Examples from the financial inclusion sector have shown how sex-disaggregated SME portfolio data has helped providers to better articulate the business case for expanding WMSME lending and make intentional adaptations to financial and non-financial product offerings to expand WMSME lending.[36] However, these efforts have not been segmented by sector. While this evidence base can help demonstrate the potential creditworthiness of the WMSMEs, performing sex-disaggregated research for data sets in the renewable energy sector will be key to making the business case for financiers in the sector.

In addition, there was a high representation of solar home system (SHS) sales in the literature review (indicative of the sector at large). This presented a challenge in identifying trends in enterprise-focused sales and financing since households are the main target customer for SHS. Accordingly, any investment uncovered in adapting business or financing models was unsurprisingly focused on increasing household sales. It is also understandable that if the majority of sales have been in SHS, there are not substantial incentives for companies to disaggregate sales or financing data by enterprise size or type. As renewable energy firms and financiers expand their product lines in the future to include more enterprise-focused goods and services, it is likely that there will be more sex-disaggregated enterprise-level data.

There was also a noticeable gap in customer research about the specific financing needs of WMSMEs in the sector, beyond more generalized information about the capital needs of businesses based on stage of growth. To overcome this knowledge gap and add to the sector's understanding, the research team conducted several interviews with WMSMEs in the sector to identify detailed financial needs and preferences. As part of this analysis, the team also sought information about the unit economics of specific renewable energy technologies to determine if WMSME preferences to forgo the use of loans to finance inventory or working capital were justified by their position in lower margin sales and distribution. However, this information was not available, likely because providers are hesitant to share it due to its proprietary nature. Consequently, this

36 Jarden, Fiona, and Anne Rappoldt. "Why a Segmentation Strategy Matters for Serving the Women's Market, Insights from Access Bank Market Research." KIT Working Paper. March 2021.

research report outlines why this information is useful to future efforts to build the business case for financing WMSMEs in last-mile distribution of renewable energy products and for PUE asset acquisition.

Overall, there were a lack of examples or best practices showing how gender can be integrated into business operations or to improve business performance. There were also few examples of renewable energy firms or financiers adapting credit models to better service WMSMEs. Where projects had pilot-tested modifications in financial models, there were not enough use cases for broader promotion.

Photo: Joost Bastmeijer/ENERGIA

IV Framework for Analysis

Given the data limitations and gaps discovered during the literature review and KIIs, the research team applied a framework based on the ecosystem, demand side, and supply side characteristics and constraints for financing WMSMEs active in the last-mile of providing renewable energy. This analysis was used to identify sector opportunities and inform the recommendations provided in Section IX. A summary of these constraints and opportunities by level of analysis is presented in Figure 7 below.

Figure 7: Ecosystem, Demand Side, and Supply Side for Financing WMSMEs in RE Sector

Ecosystem for Financing WMSMEs in RE Sector	
Characteristics or Constraints	**Opportunities**
• Insufficient amount of patient capital for RE firms providing financing may be limiting investment in refining customer financing strategies to better serve WMSMEs. • Financial regulatory environments constrain FSPs from expanding uncollateralized lending to MSMEs and, in particular, WMSME borrowers. • Restrictive legal frameworks prevent WMSMEs from registering assets in their names. • Uncompetitive financing markets result in FSPs lacking incentive to innovate or serve new target customers like WMSMEs, which they believe to be not as viable.	• Donors and investors should continue to support initiatives to incentivize additional commercial capital flows to the sector, including de-risking investments (guarantees securitization of accounts receivable, foreign exchange hedging) especially for gender-inclusive business models. • Donors DFIs and FIs can use credit guarantee facility coupled with technical assistance to motivated FSPs and RE fems to increase the flow of capital to WMSMEs, while also building the capacity of FSPs to collect analyze, and use data on serving WMSMEs as clients.

<table>
<tr><th colspan="2">Demand Side for Financing WMSMEs in RE Sector</th></tr>
<tr><th>Characteristics or Constraints</th><th>Opportunities</th></tr>
<tr><td>
Demand for available financing products by WMSMEs in certain subsectors is low.
Many women who own or lead MSMEs prefer to bootstrap to finance the startup or the growth of the business.
Lack of customer research about low demand and understanding about what is driving low demand - Is it due to deal size mismatch with needs, mistrust or unit economics of the sector that make credit unattractive?
WMSMEs' limited knowledge of financing opportunities is due to limited networks.
Woman-owned/-led MSMEs in the RE sector face discrimination from financiers since it is a predominantly male sector.
High demand exists for business support services, but few opportunities customized for the specific needs of WMSMEs are available in the market
</td><td>
Donors and Impact Investors should support RE financiers and interventions to conduct customer research for specific segments of WMSMEs to determine specific adjustments to offerings to make them more attractive to WMSMEs- longer repayment periods, more flexible repaymentschedules, non-financial services support, different outreach channels, etc.
Donors, impact investors, and international development organizations should encourage RE financiers and programs to examine how unit economics for different subsectors may impact feasibility of certain interest rate offerings, in order to determine if refinements are needed.
Donors, industry associations, and impact investors should support further research into PAYGO financing for women, identifying barriers to adoption.
</td></tr>
</table>

<table>
<tr><th colspan="2">Supply Side for Financing WMSMEs in RE Sector</th></tr>
<tr><th>Characteristics or Constraints</th><th>Opportunities</th></tr>
<tr><td>
Lack of sex-disaggregated portfolio data by PAYGO and RE financiers prevents financing gap analysis for WMSMEs.
Lack of customer segmentation makes it difficult to customize sales or financing strategies to meet WMSMEs needs and constraints. Per interviews, many impact funds have cited difficulty in finding eligible WMSMEs for financing.
Adoption of 2X Challenge criteria by investors has encouraged RE firms to improve internal policies and female representation in senior management and employment but has not yet aided gender integration within business and financing models
Insufficient understanding exists of what non-financial support is needed for the WMSME segment and how FSPs can provide it sustainably.
Capital-constrained OGS firms may deprioritize gender investments, believing that gender is not integral to their business survival.
</td><td>
Impact funds should request sex-disaggregated data on financing portfolios from their investees, especially PAYGO companies to determine if gender gaps exist.
RE financiers should collect and analyze sex-disaggregated financing data to (1) determine if there is a significant gender financing gap in their portfolios that should be addressed, and (2) create profiles for strongest repaying customers and use them to target customer outreach.
Utilizing data about financing gaps for women and WMSME customers, donors, and impact funds can support RE financiers and FSPs to pilot-test segmented approaches to WMSME finance for PUE end within the supply chain.
Support pilot-testing of bundling financial and non- financial service offerings for WMSMEs in the sector, helping RE financiers to examine business performance benefits.
</td></tr>
</table>

• FSPs lack incentives to modify, adapt, or redesign financial products to fit the needs/constraints of WMSMEs. • Financing models that have adapted requirements or features to serve WMSMEs rely on significant subsidies with the path to scale and sustainability unclear. • Even with movable collateral legal frameworks in place, many financiers are not familiar or incentivized to use them to expand lending. There are few examples of RE firms using nontraditional marketing or awareness channels to reach WMSMEs. • Many stakeholders agree that the extent of how gender is integrated into funds, businesses, and FSPs is largely personality-driven. needing key champions. • Many inventory financing options provided by banks still require collateral, a constraint for many WMSMEs. Gender constraints may prevent women from taking advantage of PAYGO.	• Donors and impact funds can provide financial support and technical assistance for RE financiers to perform in-depth customer research to segment WMSMEs to improve their sales, credit, and non-financial services support strategies and to identify and target WMSMEs most likely to benefit from PUE asset investments. • Women's entrepreneurship or economic empowerment initiatives, especially those with an access to finance component via financial institution linkage, should utilize customer segmentation to ensure sufficient WMSME interest in formal financing and that participants meet eligibility criteria when credit products are not able to be refined.

Photo: Joost Bastmeijer/ENERGIA

V Ecosystem Considerations in Enabling Gender-Inclusive Financing

As noted earlier, WMSMEs in the renewable energy sector have access to financing provided by several different types of financiers. Notably, the ecosystem in which these financiers operate is often the most influential element in enabling gender-inclusive financing. Gender norms, financial market dynamics, investment trends, and policy and regulatory environments impact how financiers can adapt to serve the women's market and why they might understand the need to adapt. In many contexts, recognizing how gender norms restrict WMSMEs' growth trajectories and access traditional financing products is key. However, if RE firms are capital constrained, lack affordable financing themselves, or operate in less competitive or restrictive policy and regulatory environments, they will have fewer incentives and resources to make these changes.

A. Gender Norms

Restrictive gender norms are often the root cause of persistent gender inequality in the financial market system. These norms shape the behavior of not just women, but all actors in the system—

from FSPs and investors to policymakers and other support service providers—and create constraints for women entrepreneurs in accessing financing and growing their enterprises. On the demand side, women entrepreneurs are often discriminated against based on assumptions about gender roles in the economy.[37] This can limit mobility, create time poverty, and restrict financial decision making and control. Norms around prioritizing household and care responsibilities often mean that women entrepreneurs may choose to keep their businesses small and adopt less aggressive growth paths. This can create the perception that women entrepreneurs are not growth oriented or that women-led businesses are not profitable. As a result, FSPs and impact funds may choose not to prioritize better understanding or design approaches for this segment. They do not invest in collecting and using sex-disaggregated data, which is foundational to understanding which customers are being reached and assessing their profitability. Instead, they may rely on products, policies, and approaches that are believed to be "gender-blind," such as requiring spousal signature or male guarantors for loans, even though these requirements actively hinder women's financial access.

Gender norms also impact formal rules and policies such as the need for immovable collateral (which women are less likely to have) or the need for multiple forms of identification. To increase women entrepreneurs' access to financing and investment, it is important for financiers to understand the restrictive norms and then either directly or indirectly address them. For example, funders and investors can invest in highlighting the market opportunity of financing WMSMEs by supporting the sector to collect and evaluate data fundamental to properly sizing the market. Investors can also intervene to incentivize FSPs to adopt new lending policies, such as cash-flow-based lending, where regulation permits, which would enable more WMSMEs to access credit. As new interactions occur between WMSMEs and FSPs, institutions will be able to better quantify the benefits of serving women entrepreneurs and provide a demonstration case for others to adopt. A key element of facilitating behavior change is understanding the incentives for a particular actor and either shifting incentives or creating new ones to adopt a change in practice. Incentives can be in the form of capital for on-lending, capacity building, or policy requirements.

A recent analysis of 2017 Global Findex data for nine Gates Foundation FSP countries showed how gender barriers vary from country to country. For example, in both Kenya and Uganda, basic literacy and numeracy were not as great a barrier to women's financial inclusion when compared to Ethiopia.[38] In Tanzania, however, a digital or national ID was found to be a more significant barrier for women when compared to Ethiopia and Kenya.[39] Though lack of access to more localized data sets restricted further segmentation of women in these countries, the findings notably show that, within regions, gender barriers are different.

37 Koning et al., op. cit. https://www.cgap.org/sites/default/files/publications/2021_10_Technical_Guide_Gender_Norms.pdf

38 --. "Preliminary Mathematica Analysis of 2017 Global Findex Database Data and Preliminary GRID Impact and SIA Analysis." Presented September 14, 2022. What Works for Women: Unpacking the Barriers and Opportunities to Women's Economic Empowerment webinar. https://drive.google.com/file/d/1rulKq-G5AO1BsWaleMQPQ0M3Rubzr3M6/view

39 Ibid.

B. Financial Market Dynamics

The International Finance Corporation (IFC) estimates that 65 million firms, or 40 percent of formal micro, small, and medium enterprises (MSMEs) in developing countries, have an unmet financing need of $5.2 trillion USD every year.[40] Of these firms, the gap for women-led MSMEs is approximately $1.7 trillion, highlighting the significant demand for financing by WMSMEs and presenting an opportunity for growth for financiers.

In most low-income and emerging economies, demand for financing is much greater than the supply. Therefore, financiers serving the renewable energy sector can be selective in choosing clients they "feel'" are the most profitable, with little incentive to innovate or target new customer segments, like WMSMEs. This may be especially true in financial services markets that do not have significant competition or in countries that have interest rate caps or central bank regulations requiring collateral. In these contexts, traditional financial institutions often perceive any derivation from standard financial products as risky or as a potential threat to portfolio quality, making them less likely to invest in product innovation or to expand financial offerings for businesses beyond the most basic ones, such as standard collateralized working capital or asset financing loans. Although non-traditional financiers, like RE firms providing their own finance, may not be subject to the same restrictions in these markets, their perceptions may be similar. On the other hand, in more competitive or less restrictive country contexts, expanding outreach to women as an underserved market can create a competitive advantage for financial providers.[41]

Therefore, it is important for donors, impact funds, international organizations, and other support organizations to understand what may be driving financiers in the renewable energy sector to serve or not serve certain customer segments and provide incentives for taking on the perceived risk. There are many examples of interventions using partial guarantees that de-risk financial institution lending to underserved customer segments, like women. However, maintaining lending post-guarantee is largely dependent on the intentions of the lender and a clear understanding of what providers need in terms of a demonstration case. In more challenging environments, identifying financiers want to distinguish themselves from peers or have a specific focus on women and/or renewable energy may be the most effective way to ensure buy-in.

C. Investment Trends

Innovations, such as serving a new customer segment, require financial resources, knowledge, and skills that many financiers working in low-income financial markets do not have. In many markets, FSPs interested in serving women entrepreneurs face constraints accessing investment capital or

40 IFC. "Global Overview: IFC Financing to Micro, Small and Medium Enterprises." IFC MSME Factsheets. 2019. https://www.smefinanceforum.org/sites/default/files/IFC_MSME_Factsheets_Global_2019.pdf

41 IFC and Goldman Sachs. "10,000 Women: Investing in Women's Business Growth—The Women Entrepreneurs Opportunity Facility Progress Report." 2019. https://www.ifc.org/wps/wcm/connect/dda519ef-ef2b-4bf4-910f-38d669ceddb7/WEOF_Report%2312-final.pdf?MOD=AJPERESandCVID=mTqacil

funding to seed new product ideas, training staff in evolving client-centric business practices, or simply fuelling growth. Limited access to capital prevents financiers from targeting women entrepreneurs, whom they consider to be high-risk/low-return customers. FSPs are also forced to prioritize larger loans due to the high cost of investment capital in most low-income economies. As a result, many women-led businesses do not fit the target segment for these FSPs.

In the last decade, even as many investors focused on adopting environmental, social, and governance (ESG) criteria in investments, significant evidence has pointed to how gender, which is key to sustainable investing, has been largely missing from these investments. More recently, the growth of gender lens investing and the creation of initiatives such as the 2X Challenge are helping channel investments toward gender outcomes, but the size of demand is still much larger than the supply. The World Bank estimates that the gender finance difference is $1.7 trillion USD.[42] However, the lack of clear frameworks to understand and assess the gender impacts of investments limits interest from institutional investors. In 2020, less than 3 percent of all venture capital went to women-led start-ups,[43] even though significant evidence shows how gender-diverse start-ups and women-led ventures often outperform male-led ventures.[44] Closing this gap in investments and supporting gender-smart investing present tremendous growth opportunity for financiers and overall economic growth to reduce poverty and gender inequality.

As noted in the World Bank Report, "Funding the Sun: New Paradigms for Financing Off-Grid Solar Companies," finding appropriate funding for vertically integrated businesses that are providing the technology, managing distribution, and also providing financing remains a constant challenge for companies to scale.[45] In fact, the long cash-to-conversion cycle may take up to three years from product design to final loan repayment.[46] Other challenges such as foreign currency mismatches and import issues impact profitability of companies, making financing the sector extremely difficult. More specifically, debt financing for OGS sector companies is more complicated due to the unusual type of assets a company has to pledge as collateral.[47] While access to capital has increased for SHS system companies, there is still a large financing gap. And other subsectors, such as PUE, have seen only modest capital flows. As noted by Acumen in its "Bridging the Gap" report, investment in PUE firms has been low since investors still deem such companies as high risk.[48] As a consequence, many KIIs cited funding constraints as an impediment to investing in customer research or testing innovative models to increase women's participation in the renewable energy value chain.

42 Ibid.
43 Bittner, Ashley, and Brigette Lau. "Women-Led Startups Received Just 2.3% of VC Funding in 2020." https://hbr.org/2021/02/women-led-startups-received-just-2-3-of-vc-funding-in-2020
44 Abouzahr Katie et al. "Why Women-Owned Startups Are a Better Bet." Boston Consulting Group. June 06, 2018. https://www.bcg.com/publications/2018/why-women-owned-startups-are-better-bet
45 ESMAP. "Funding the Sun: New Paradigms for Financing Off-Grid Solar Companies." Washington, DC: World Bank. 2020. p. 14.
46 Ibid.
47 Ibid.
48 Labruto, Leslie, et al. "Bridging the Gap—What We Learned from Pioneering the Next Wave of Energy Access." Acumen Energy. 2022.

D. Policy and Regulatory Environment

Given the important role of financial services in an economy, financial markets are subject to heavy regulations. Regulation of financial services varies greatly among countries. Regulations that are too restrictive, too lax, or inappropriate can hinder access to finance for marginalized and excluded populations. Regulatory requirements around how many uncollateralized loans a financial institution can provide, while helpful in maintaining financial sector stability, often translate into prohibitive collateral requirements by FSPs, leaving women entrepreneurs unable to access loans. However, well-designed regulations can also incentivize FSPs to target certain populations. Several countries, such as Ethiopia and Zimbabwe, have passed regulations to support the creation of movable collateral registries.[49] This will allow FSPs to expand the range of acceptable collateral from fixed assets such as land, which women are less likely to have, to other enterprise assets such as machinery and equipment.

Another example of a policy initiative to incentivize financing for women entrepreneurs is from Egypt, where the Central Bank of Egypt (CBE) issued a guideline instructing banks to increase financing to WMSMEs to 25 percent of the portfolio in 2021, up from 20 percent in 2016. In addition, each bank was directed to establish specialized units for providing financial services to WMSMEs. The CBE also incentivized banks to lend to MFIs and NGOs in order to reach microenterprises.[50] Formal business registration is a critical step in growing a business. However, complicated and gender-blind registration requirements make it challenging for women entrepreneurs to register and grow their businesses. In many countries around the world, women are required to provide their husbands' signatures to register a company or to open a bank account, which affects their autonomy. In addition, the list of documents required and the number of steps in acquiring a business registration might discourage women who may not have all the necessary documentation or the time to finish the process. Simplified, tiered, and digitized business registrations can lower the barriers to formalization for women-led businesses.

Opportunity 1: GLI-oriented donors and investors should continue to support initiatives to incentivize additional commercial capital flows to the sector, including de-risking investments (guarantees, securitization of accounts receivable, foreign exchange hedging), especially to support businesses, financial institutions, or initiatives provided that partners demonstrate a strong commitment and business interest in customer centricity and more gender-inclusive financing models.

Opportunity 2: Donors, development finance institutions (DFIs), and international finance institutions (IFIs) should use a credit guarantee scheme coupled with technical assistance to motivated FSPs and renewable energy companies providing finance in order to increase the flow of capital to WMSMEs, while also building their capacity to collect, analyze, and leverage data to refine financing for WMSMEs.

49 AFI and SME Finance Working Group. "Policy Catalogue: Women-led MSME Access to Financing." 2022. https://www.afi-global.org/wp-content/uploads/2022/08/Policy-Catalogue-Women-led-MSME-Access-to-Financing-24082022.pdf

50 Ibid.

VI WMSME Demand for Financial Services and Barriers to Entry

Women-led businesses are an important vehicle for enhancing women's economic opportunities and agency, and they contribute significantly to poverty reduction and economic growth. Even though women represent 50 percent of the world's population, control one-third of the world's wealth, and are one of the world's largest, fastest-growing market segments, they are still chronically underserved by financial institutions and financiers when compared to men.[51] As highlighted earlier, the International Finance Corporation (IFC) currently estimates the financing gap for women-owned/-led MSMEs to be approximately $1.7 trillion USD.[52]

The financing gap has persisted partly due to the fact that financiers have largely taken a gender-neutral approach (which, in reality, is gender-blind) to financing entrepreneurs and therefore have not invested in understanding how WMSMEs' financing needs and preferences may be different from their male counterparts. Because women are also viewed as a monolithic customer group,

51 Jarden and Rappoldt, op. cit.
52 IFC Global Overview. IFC Financing to Micro, Small and Medium Enterprises. 2019. https://www.smefinanceforum.org/sites/default/files/IFC_MSME_Factsheets_Global_2019.pdf

adaptations that have occurred have utilized a one-size-fits-all approach for financial product design and delivery.[53]

Since many providers and interventions have not yet undertaken customer research to understand different female customer segments, there are significant gaps in understanding about the specific financing needs and demand for financial services by micro, small, and medium enterprises. ENERGIA and others have identified the key financing needs of energy enterprises by business stage, as well as the respective constraints faced by a wide range of women entrepreneurs.[54] However, it is not apparent that financiers are performing their own research to understand the specific barriers of their target women segments.

With this in mind, the research team has conducted multiple interviews with micro, small, and medium enterprises to identify the specific needs of each business type in various renewable energy sectors. The team interviewed three female owners of medium-sized businesses in the waste-to-energy, mini-grid, and bio-gas subsectors. Two interviews were also with micro entrepreneurs who participated in Energy 4 Impact's Foyré Rewbé 2 Project in Senegal, which financed solar freezers to support its women's association's processing business. Recognizing the knowledge gaps in the sector's understanding of distinct women-led enterprise segments, the Distill Inclusion team compiled the following insights from interviews and discussions with other stakeholders to identify the specific needs of each business type in various renewable energy subsectors. While only anecdotal, the findings provided are intended to highlight examples of where segmenting WMSMEs into different categories would be beneficial for future programs to maximize uptake, eligibility, demand, and impact.

As presented in Section VII- Customer Research and Defining Customer Segments for WMSMEs in the Renewable Energy Sector, the team used the interviews with women entrepreneurs to create two distinct personas for women-led businesses. These profiles are intended to provide renewable energy sector stakeholders with a more nuanced picture of the financing needs, barriers, and desired non-financial support services of different customer segments. These personas by no means cover the full range of women entrepreneur segments but provide a useful starting point to illustrate differences in characteristics and traits. They should inspire renewable energy firms, financiers, and financial services providers to engage in their own research to develop personas based on the targeted customer segments for their respective businesses.

A. Key Financing Needs of WMSMEs in the Renewable Energy Sector

Since the scope of the research was largely focused on micro and small enterprises, the demand or need for equity financing was largely absent from the team's discussions with key informants. Other limitations include a lack of sex-disaggregated data among the financing providers consulted. Consequently, this section looks at demand for debt financing for inventory, business

53 IFC. "Women-Owned SMEs: A Business Opportunity for Financial Institutions—A Market and Credit Gap Assessment and IFC's Portfolio Gender Baseline."2014.

54 Dutta, op. cit.

growth, and workforce expansion as self-reported by women-owned/-led small and micro enterprises or by different renewable energy–focused women's entrepreneurship programs or funds.

Across several programs, there appears to be a misunderstanding about demand and the need for finance. From the outside, programs have assessed the utilization of financing from formal institutions or lack thereof and have focused resources on trying to incentivize or encourage market actors to serve more women. However, in several interviews, key informants highlighted low demand for finance by the women entrepreneur partners and a preference to bootstrap instead, gathering capital from more informal sources (even moneylenders) in lieu of using more formal bank financing.[55] ENERGIA's Practical Action Women in Energy Enterprises program partner found that only 6 percent of the 401 women entrepreneurs they worked with were initially interested in bank financing. Possible explanations for this range from poor unit economics or margins for goods sold, high risk awareness of potential downsides of commercial financing, different business growth motivations/trajectories, mistrust of financial institutions, or inappropriate financing options.

In several interviews, key informants suggested that the unit economics for certain renewable energy products may be primarily responsible for low demand for formal financing. As indicated by research from the Women Entrepreneurs Finance Initiative (WE-FI), "The clustering of women entrepreneurs in low-margin industries means that profits and productivity hover around 50 percent that of men."[56] If WMSMEs are indeed currently concentrated in lower margin renewable energy businesses, forgoing loans at market rates is a very rational choice. For example, in the improved clean cookstove subsector, smaller margins for each product sold mean that profits may not be sufficient to repay interest. This type of risk-aware behavior is sometimes misclassified as risk-averse.

Recruited female sales agents from CIDR/PAMIGA's program, also known as "energy entrepreneurs", did express demand for small working capital loans to perform product promotion work, cover transport costs, and buy stock or products for demonstration. Without it, CIDR/PAMIGA found that energy entrepreneur dropout rates were high, since they were not doing a lot of product promotion and became demotivated after they saturated the demand from their closest networks and income slowed. They simply lacked the capital to develop new markets that were farther away.

In higher margin distribution businesses, such as mini-grid systems or clean energy appliances, WMSMEs expressed demand for smaller loan or deal sizes, lamenting that they were not always available. As one female business owner noted, her start-up ticket size of about $100,000 USD was too small for the banks that she approached when starting her business. Then later, after growing the business, she still had trouble finding investment capital of $350,000, since most investors or banks weren't interested in a deal size of under $1 million.[57]

55 Interview with Practical Action, July 14, 2022.
56 Siegrist, Felicia. "Women Entrepreneurs Finance Initiative (WE-FI) Theory of Change Review and Evidence Paper." 2022.
57 Interviews with WMSME owners.

With regard to the productive use of energy (PUE) financing, WMSMEs that are commercially active in other sectors like retail, food services, or agriculture have also highlighted mismatches between the sector's perceptions of women's preferences and commercial viability. USAID Feed the Future Small Irrigation Innovation Lab noted that during its programming, women farmers showed a preference to grow different crops that had more continuous income streams than more traditional cyclical cash crops with one or two growing seasons. Increased control over smaller amounts of income, smaller plot sizes, and less risk were cited as possible explanations.[58] Despite this risk-aware behavior, recognition of locus of control over income dictated by social and/or cultural norms was often interpreted by solar irrigation firms or financiers as meaning that women's farming businesses were not commercially focused or viable.

B. Barriers to WMSME Finance

The constraints that WMSMEs in the renewable energy sector face vary based on the size of the business, country context, and RE subsector (improved cookstoves, solar lanterns, solar home systems). Existing financial inclusion and renewable energy research has generally identified several main barriers that women-led micro, small, and medium enterprises confront when accessing financial services, including (1) legal, regulatory, and policy barriers, such as documentation or lack of collateral, (2) limited availability of financing due to misperceptions of viability/bankability, (3) inappropriate or generic financial products that do not suit WMSME needs, and (4) cultural or technological barriers faced by women customers. This is often coupled with an incomplete understanding of the unit economics of the RE technologies women are selling or distributing. In aggregate, these challenges impact WMSMEs' demand for traditional types of credit, suggesting that financing efforts need to be customized based on in-depth WMSME and subsector research.

As noted by ENERGIA in its "Supporting Last-Mile Women Energy Entrepreneurs: What Works and What Does Not" report, many women entrepreneurs who are distributing or selling renewable energy products to end users are not able to access the multitude of products available to their male counterparts. For programs or renewable energy firms linking their supply chain actors or customers with microfinance institutions or commercial banks, insufficient collateral and failure to meet financial documentation requirements were cited as challenges for the WMSMEs served. Several of the key informants noted that the women entrepreneurs in their programs were unable to take advantage of lease-to-own programs because they did not have the full initial deposit of 20–30 percent. Shorter loan repayment periods and high interest rates were also highlighted as barriers to accessing finance. As noted earlier, these barriers often lower WMSMEs' appetite to solicit traditional credit or other potential financial products and services that could be of value to them.

58 Interview with Dr. Nicole Lefore, USAID Small Irrigation Innovation Lab, June 2022.

Gender Constraints in PAYGO Financing Models, CGAP

While few companies in the sector track sex-disaggregated data, anecdotal evidence indicates that women may only represent 25 percent of all registered PAYGO customers. This financing gap suggests that women do not have equitable access to this more affordable finance option. Quantifying this gap is a necessary precursor to understanding where PAYGO might be less appealing or accessible for women. Barriers such as digital literacy gaps, high down payment percentages, identification requirements, total interest charges, and cultural obstacles to women's asset ownership may be impacting uptake.

Other barriers such as sales strategies and marketing techniques may have an impact on women's utilization of PAYGO. An overwhelming male salesforce may "lack the tools and incentives to reach out to potential female customers." Moreover, the sector may be missing opportunities to refine value propositions to greater emphasize how products can solve women's energy needs.

CGAP has identified several gender-based barriers that women face in accessing PAYGO financing for solar throughout the product value chain, including affordability challenges for the 10–20 percent asset down payment, digital financial literacy gaps, cultural or social norms regarding women's asset ownership, and lack of identification required for purchase.[59] This type of research is needed to better understand where and when PAYGO providers can refine products to make them more inclusive, or to help providers identify specific customer segments where these challenges may be less present. The PAYGO sector has made progress in improving risk management and customer protection, such as adopting GOGLA's Consumer Protection Code, which will benefit all PAYGO users, but more research and data are needed to identify how this financing and payment mechanism serves women.[60]

Opportunity 1: Donors and investors should support further research into PAYGO financing for women by asking for sex-disaggregated data and identifying barriers to adoption that include onerous qualification criteria, inappropriate outreach channels, digital barriers, and prohibitive interest costs, with the goal of encouraging providers to refine offerings or adopt customer segmentation strategies in order to target women who are interested and able to meet criteria.

59 Kumaraswamy, Sai Krishna. "Examining PAYGo Solar Through a Gender Lens: An Exploratory Study." CGAP. April 2021. https://www.findevgateway.org/slide-deck/2021/04/examining-PAYGo-solar-through-gender-lens-exploratory-study

60 Waldron, Daniel. "Where Credit is Due: How to Safely Scale PAYGo Finance." Acumen Fund. 2022. https://acumen.org/blog/where-credit-is-due-how-to-safely-scale-PAYGo-finance/

C. Non-Financial Service Needs

Many of the key informants interviewed cited the need for non-financial services/business training as an accompaniment to financing for WMSMEs. However, there are several challenges in disaggregating the need for these NFS by specific female customer segment. The existing body of evidence around women's entrepreneurship programming highlights the need for business training to improve women's business profitability and impact. However, none of the renewable energy firms, program interventions consulted in the literature, or interview groups created customized NFS programming for defined female segments, nor did they utilize any control groups to determine whether non-financial services support was a necessity for the various female entrepreneurs they served. Many programs and financial services providers involved in the sector are offering these services based on an awareness that WMSMEs are, on average, less financially literate and lack business financial management or entrepreneurship training. Because women-focused programs comprise a mix of different types of entrepreneurs, it is challenging to identify which support services may be needed for specific customer segments. This is also problematic for making the business case for financiers to integrate non-financial services with product offerings. Since NFS are not revenue-generating activities and are often cross-subsidized, financiers need to see a direct connection between strengthening WMSMEs and their own bottom lines. Without a strongly articulated business case, and ensured profitability, financiers are more apt to be interested in working with more advanced, investment-ready WMSMEs at the start—those enterprises that may need a small amount of support—before they would be willing to take on more formalized women's entrepreneurship and empowerment initiatives.

Despite a lack of research on the specific non-financial business needs of women distributors and retailers in the renewable energy sector, there is evidence suggesting that WMSMEs purchasing PUE require additional business planning support to achieve positive impacts on profitability and ensure the viability of energy investments. The evidence differs from a prevailing industry belief that productive investments in energy-efficient technologies benefit male and female enterprises equally.[61]

61 Pueyo, Ana, and Mar Maestre. "Linking Energy Access, Gender and Poverty: A Review of the Literature on Productive Uses of Energy." Energy Research and Social Science, Volume 53 (July 2019): 170–181. https://www.sciencedirect.com/science/article/pii/S2214629618306145

Opportunity 1: Donors and impact investors should support financiers serving renewable energy sector actors to conduct customer research for specific segments of WMSMEs to determine which specific adjustments to credit offerings are needed to make them more attractive to WMSMEs: longer repayment periods, more flexible repayment schedules, non-financial services support, different outreach channels, etc.

Opportunity 2: Donors and impact investors should encourage financiers serving renewable energy sector actors to examine how unit economics for different subsectors, especially those where WMSMEs are concentrated, may impact the attractiveness of credit offerings to refine terms where possible.

Opportunity 3: Donors and impact investors should support pilot-testing non-financial services offerings for WMSMEs in the sector, helping financiers serving renewable energy sector actors to examine business performance benefits.

Photo: Joost Bastmeijer/ENERGIA

VII Supply Side Considerations and Constraints

When the research team embarked on this study, the expectation was that there would be several successful and sustainable financing innovations addressing WMSMEs' access to financing, led by either FSPs or renewable energy companies providing finance for consumers or supply chain partners. One of the team's original hypotheses was that innovation in the sector was likely to be found in more competitive markets, where legal or regulatory ecosystems did not hinder lending adaptations. Given the challenges that some WMSMEs face, it was anticipated that RE firms would identify and target specific segments of women enterprises to develop innovations. By highlighting these first movers, the goal was to illustrate the business case for others to innovate to better serve WMSMEs. However, the survey did not reveal any market-driven, scalable financing programs distinctly targeting WMSMEs as core customers or supply chain partners. Still, there were several RE firms providing consumer financing, with a specific focus on women customers.

The Distill Inclusion research team asked key informants to share their opinions on what is driving the gender-inclusive changes that have been instituted by some entities. Most respondents agreed that the commitment of the management team or founder was key to prioritizing gender within business and financing models. Though fewer in number, firms that have invested in data-driven decision making and customer centricity are also believed to be most willing to make adaptions in business and financing models since they are continuously performing customer research and defining specific customer segments that encourage these types of changes. After conducting the literature review and KIIs, however, the team was unable to find any examples of firms or FSPs intentionally modifying financing to expand access for WMSMEs that did not heavily rely on subsidization from development organizations or crowd funders. The task was also made difficult by the fact that many renewable energy companies do not appear to be sex-disaggregating their portfolio data for greater analysis, and that entities are not segmenting their customers beyond gender. Even for promising financing models like PAYGO, the lack of available sex-disaggregated data makes it difficult to evaluate whether it addresses WMSMEs' access constraints. Consequently, the following discussion highlights some of the current supply side trends and opportunities for investment and draws upon successful examples from outside the sector.

A. Gender-Integrated Business Strategies

Partly driven by the search for additional capital from gender-lens investors and having to tackle a persistent gender gap in energy access and financing, many impact funds and their investees have adopted the 2X Challenge gender criteria (listed in Figure 8). Consequently, renewable energy-focused impact investors have begun to prioritize investment in woman-owned/-led firms or firms whose product or service specifically or disproportionately impacts women as customers. They require investees to compile and report sex-disaggregated data for their customers and to track women's representation in their senior leadership and across the organization as employees. Funds are also providing technical assistance to help businesses adopt new gender policies and procedures to encourage a gender-equitable workplace. Long-term benefits of these types of investments have been well documented by impact investment research firms, such as Calvert Impact Capital, showing that gender-equitable companies have improved business performance[62] and that salesforce diversification can contribute to the onboarding of more female customers.[63]

62 Calvert Impact Capital. "Just Good Investing: Why Gender Matters to Your Portfolio and What You Can Do about It." 2018. https://calvertimpactcapital.org/resources/just-good-investing

63 Soria, L., et al. "With Solar Sister, Forward We Go: A Qualitative Assessment Exploring How Solar Sister Brings Light, Hope, and Opportunity to Women in Africa." International Center for Research on Women. 2016. https://www.icrw.org/publications/with-solar-sister-forward-we-go/

Figure 8: 2X Challenge Gender-Lens Investing Criteria[64]

				Threshold
Direct Criteria	1	Entrepreneurship	1A. Share of women ownership	51%
			OR	
			1B. Business founded by a woman	Y/N
		OR		
	2	Leadership	2A. Share of women in senior management	30%
			OR	
			2B. Share of women on the Board or IC	30%
		OR		
	3	Employment	3A. Share of women in the workforce	30-50%*
			AND	
			3B. One "quality" indicator beyond compliance	Y/N
		OR		
	4	Consumption	4. Product or service specifically or disproportionately benefits women	Y/N
		AND		
Indirect	5	Investments through Financial Intermediaries (FIs)	5A. On-Lending facilities: Percent of the Investor/ FI loan proceeds or percent of FI's portfolio supporting businesses that meet direct critera	30%
			OR	
			5B. Funds: Percent of portfolio companies that meet the direct criteria	30%

*sector-specific thresholds

Despite an overwhelmingly male workforce and customer base, the sector has made significant strides in improving the internal composition of its teams using the criteria shown in Figure 8. Supported by development agencies like USAID POWER AFRICA and the World Bank/IFC, development finance institutions (DFIs), off-grid energy investors, and private sector companies have received technical assistance to include more women in their pipeline and to integrate key gender-related considerations into the due diligence process. The USAID POWER AFRICA Gender Smart Investing program worked with four investment funds—ResponsAbility, Triple Jump, Sunfunder, and Green Mac Advisors—introducing new tools for investment teams to become more gender responsive. One of those tools, gender-action plans (GAPs), was designed to help investment officers co-develop action plans with their investees. Although investees have adopted the 2X criteria, many of the stakeholders interviewed suggested that gender integration into business models was modest and mainly focused on internal employment or policy interventions.

64 2x Challenge. Investment Criteria for Gender-Lens Investment. https://www.2xchallenge.org/criteria

AlphaMundi's Investment and Technical Assistance to Twiga Foods, Kenya

Twiga, a fresh and packaged food distributor, sources goods from farmers and food manufacturers to deliver them to small retailers through its online marketplace. As part of its B2B offering, it developed a Sokoloan product, providing financing for informal vendors. With AlphaMundi's support, Twiga employed targeted efforts to improve outreach to female vendors about its loan offering. After two months, the number of female vendors accessing loans had doubled, and its vendor base had expanded.

Similarly, gender-action plans have predominantly dealt with improving 2X Challenge criteria metrics since these impact metrics are being tracked by funders. Perhaps due to recent solvency challenges related to declining portfolio quality and stagnant sales growth as a consequence of COVID-19, many companies often believe that it is a choice between business survival or gender responsiveness and must prioritize the former. Due to this narrow focus, funds may be missing an opportunity to help RE firms see how gender is connected to their overall business models, supporting them in developing more gender-inclusive strategies for customer and supply chain partner outreach and financing. Also noteworthy, the research team was not able to find any examples of impact funds that had evaluated their portfolio's performance pre– and post–2X Challenge gender criteria adoption.

An example of a fund that is successfully helping its RE and non-RE investees become more gender intentional is AlphaMundi.[65] Its business-first, gender-smart technical assistance (TA) for SMEs in East Africa and Latin America is unique since it focuses on both external and internal gender disparities, as well as improving business performance. Applying the Criterion Institute's Gender Framework, the fund first helps investees to identify gender gaps and opportunities within the business model.

Opportunity 1: Gender-smart technical assistance should be expanded to connect gender targets and outcomes directly to business performance and health.

Opportunity 2: Impact funds should measure key business performance metrics pre– and post–gender-action plan implementation to articulate the business case for gender integration into business models.

65 https://www.alphamundifoundation.org/portfoliogli

B. Sex-Disaggregated Data Collection and Portfolio Analysis

As part of their day-to-day business, financiers collect and track many different types of data on their clients, ranging from product uptake, portfolio performance, customer satisfaction, or customer retention. For example, OGS or cookstove focused companies with multiple product lines often look at uptake by each product type to make business decisions about which product lines to promote or which need additional marketing. Sex-disaggregating these metrics is also a way for firms to recognize if they have gaps for each performance metric between their male and female clients. After sex-disaggregating the three different indicators on customer challenges, resolution, and the Net Promoter Score, Kaleidofin, a fintech in India focused on serving a predominantly rural, low-income female customer base, discovered that 50 percent more female clients reported having challenges with their products than male clients did, and two-thirds fewer female clients than male clients reported having their challenges resolved. This may have had an impact on female Net Promoter Scores, which they found to be lower than for male clients.[66] Without considering this sex-disaggregated data, the fintech would not have noticed that customer complaint resolution processes were not working as well for female clients, which could impact customer referrals and retention.

Outside the Sector—KCB Bank Kenya

Once it began sex-disaggregating, KCB, a leading SME banking institution in Kenya, realized that 40 percent of its business customers were women-led, but that only a small number of them were utilizing their loans.

Recognizing this gap, the bank conducted customer research to better understand WSMEs' unique financial and non-financial services needs. Perhaps unsurprisingly, the bank's research revealed that lack of collateral and lower asset ownership were constraints. It also learned that WSMEs wanted a stronger relationship with their bank, with more customized attention to their individual businesses and more opportunities to build their knowledge, networks, and confidence.

Armed with this new knowledge, the bank set out to design non-financial services offerings that would provide the support WSMEs desired. It also refined its credit offering to instead use cash-flow-based lending so that lack of collateral would no longer be a constraint for WSME loans. The results reinforced that KCB's investment had paid off—WSMEs utilizing cash-flow-based appraisal credit methodology had 0 percent non-performing loans, versus 12 percent for its overall SME portfolio.

- from FMO and IFC's Report on Non-Financial Services: The Key to Unlocking the Growth Potential of Women-Led Small and Medium Enterprises for Banks, 2022

66 Mitha, Aiaze, Faith Biegon, and Peter Zetterli. "Banking in Layers: Five Cases to Illustrate How the Market Structure for Financial Services Is Evolving." Working Paper. 2022. Washington, D.C.: CGAP. https://www.cgap.org/research/publication/banking-layers-five-cases-illustrate-how-market-structure-financial-services

The 2X Challenge criteria require that firms sex-disaggregate customer data to measure sales to male and female customers, which is an important starting point for measuring gender inequity in access to off-grid solar products. However, not all customers are accessing or utilizing financing to make purchases. According to GOGLA's 2021 sales and impact data report, "While both cash and PAYGo sales have grown compared to the previous data collection round, PAYGO has been the main driver of the upwards trend in 2021, well surpassing 2019 levels." Consequently, this trend suggests that credit access may be an important component to expanding the customer base.[67]

Although indirect metric 5 in the 2X Challenge criteria requires financial intermediaries to track the percentage of loan proceeds serving women, the Distill Inclusion research team was unable to find any evidence of sex-disaggregated portfolio analysis by RE firms. Since many renewable energy firms have become financiers of last resort for their off-grid solar and PUE customers, analyzing women's representation in their debt portfolios is one measure to determine whether firms are serving women equitably or if there are internal or external factors impeding them.

Without this base level of data, it is not only difficult to identify best practices and successful strategies for WMSMEs, but also to understand where gaps may exist. As the credit element of RE firms has developed somewhat organically and out of necessity, it is possible that current struggles with portfolio quality may provide the impetus for collection and analysis of this information in the near term. Even though the providers interviewed routinely noted challenges in reaching more women customers, without this data collection and analysis they may be missing opportunities to adjust credit models, credit delivery, or outreach strategies to reach more women. Similarly, they may be missing an opportunity to identify which customers are their most profitable and least likely to default. It is possible that once these data are made available, RE firms would see similar trend data that already exist in the financial inclusion sector, demonstrating that WSMEs are better credit customers than their male counterparts and that women, on average have a higher rate of repayment, even after controlling for loan size.

Opportunity 1: Impact funds should request sex-disaggregated data on financing portfolios from their investees, especially PAYGO companies.

Opportunity 2: Renewable energy firms providing finance should collect and analyze sex-disaggregated financing data to (1) determine if there is a significant financing gap in their portfolios that should be addressed, and (2) create profiles for the strongest repaying customers, and use those profiles to target customer outreach.

67 GOGLA. "Global Off-Grid Solar Market Report: Semi-Annual Sales and Impact Data." Public Report. July–December 2021.

C. Customer Research and Defining Customer Segments for WMSMEs in the Renewable Energy Sector

Customer research. According to the 60_decibels impact study of the off-grid sector in February 2020, 68 percent of energy customers are men, 58 percent of households reported that male household members initiated a purchase, and 61 percent of male household members made the decision to buy alone. Although increasing the energy access of households also provides benefit to women, "gender dynamics may affect perceptions of who owns these valuable products, who can use them, and which uses get prioritised when there are competing demands within a household."[68] Therefore, the importance of having a female customer base to ensure that energy access benefits female household members cannot be overstated. According to Acumen, many companies are interested in reaching more women but lack the capacity to do so. This has been especially true during the COVID pandemic, when many other challenges (supply chain issues, inability to reach customers, PAYGO, etc.) are threatening their business models. Anecdotally, firms have cited challenges in reaching female customers, with the lack of decision-making power or control over resources within households as the explanation for low female customer outreach.

In both the literature review and the key informant interviews, women were commonly viewed as a monolithic customer segment, with businesses recognizing and quantifying the impact that OGS, cookstoves and PUE have on households and women. In fact, it seems that gender is still considered only through the lens of impact measurement and not as integral to achieving business outcomes. Perhaps due to this perception, the team's analysis did not find many examples of non-female-focused RE firms that have utilized defined customer segments within their sales and financing strategies, separating enterprise clients from individuals. Fewer still were examples of RE firms leveraging this analysis to evaluate product uptake or to refine outreach strategies for specific client groups.

In other disciplines such as financial inclusion, collecting sex-disaggregated data has a high correlation with banks adapting product offerings when they see gender-related differences in behaviors and needs. Examining the availability of women's financial inclusion data across six countries, the Women's Financial Inclusion Data Partnership revealed that FSPs seem to have greater awareness of the business case of serving the women's market after collecting and using sex-disaggregated data. In Bangladesh and Kenya, this awareness is somewhat due to enhanced competition in the banking sector and the need to both grow the customer base and differentiate from competition. Some Kenyan FSPs were swayed partly by the influence of development finance institutions such as the IFC, which has introduced WFI-focused programs. Turkish FSPs have gained an appreciation for the economic importance of women SMEs, amplified by the government, the European Bank for Reconstruction and Development (EBRD), other donors, and regional and local business associations. In Honduras, all banks report supply side gender data to the regulator, and several have launched women's market offerings. However, this does not appear to be the case in

68 Harrison, Kat, Shahnaz Khan, Tom Adams, and Sasha Dichter. "Why Off-Grid Energy Matter." 60_decibels Impact Performance Report. February 2020. p. 25.

the RE sector thus far. It could be that this is still a new exercise for the sector and its businesses, that other business challenges are preventing the making these adjustments, or that RE firms do not fully recognize the business case for collecting data on female customer segments.

Important industry leaders have highlighted the needs and barriers faced by women in the sector, but they have been presented for women in aggregate. While identifying these specific challenges has been critical to helping sector actors understand how and why women customers/enterprises may require additional support, it may also be reinforcing the perception that reaching women customers and supply chain actors will require substantial resources that firms do not currently have or that they are less viable customers. In other cases, KIIs suggested that there simply weren't that many WMSMEs in the sector to finance, which is hard to validate given the data gaps discussed earlier. If it is indeed the latter, an opportunity exists for women's entrepreneurship programs focused on developing RE entrepreneurs to serve as a pipeline for these financiers. For example, the African Enterprise Challenge Fund Nkwanzi Programme in Uganda provides female entrepreneurs with one-on-one and peer-to-peer coaching and mentorship to support investment readiness.[69]

Opportunity 1: Donors and impact funds should provide financial support and technical assistance for financiers serving the RE sector to (a) perform customer research and develop segmentation strategies that include WMSMEs, and (b) improve sales, credit, and non-financial services strategies to identify and target WMSMEs that are best positioned to improve profitability from PUE asset financing.

69 African Enterprise Challenge Fund, Accessed on September 19, 2022. https://www.aecfafrica.org/cyclone-ana-recapo-rises-above-the-storm-to-power-up-clients-2-2/

Using WMSME Personas to Better Understand the Demand, Constraints, and Opportunities for Financial Product Adaptations

One method that financiers to the RE sector can use to better understand WMSMEs' financing demands, needs, constraints, and opportunities is the development of personas for their target clients. In this exercise, RE businesses and financiers can conduct short interviews with their perspective clients to better understand product and service delivery preferences, constraints, and financial and non-financial needs. With this information, these entities can create profiles for their clients to help them better refine or design new products ensuring better uptake. For financiers that have cited difficulty in identifying more WMSME customers, personas can be used to profile existing female clients in order to understand how to reach new ones. The Distill Inclusion team has created two distinct personas based on multiple interviews with women RE entrepreneurs. The first profile is a representative of the persona called the Value Creator, representing women entrepreneurs who run small to medium businesses (WSMEs) in the RE sector. The second profile represents the persona of the Pragmatist, describing women entrepreneurs who run micro enterprises (WMSEs) using PUE assets.

THE VALUE CREATOR

Female | 35–42 years| Lives in a capital city in an SSA country | Sector: Renewable Energy

Background

The Value Creator is motivated by her desire to ease the challenges faced by women micro-entrepreneurs in her community. She leverages her own business experience and knowledge to identify innovative and affordable renewable energy (RE)-based solutions for her target segment. She used her own networks and funds to get her business off the ground and sees several opportunities for growing her business but is unable to find the right financing and investment products. Her cautious growth path is seen as being risk averse, and her desire to grow at steady pace rather than exponentially is seen as a lack of ambition.

Business Journey

The Value Creator started her business three years ago, and despite the COVID-19 pandemic, it has more than doubled during this time. She saw that women in rural areas faced significant energy- and time-poverty and recognized that access to RE-based cooking solutions and farming appliances could significantly improve the lives of these women while also providing them with income-generating opportunities. She started the business with investments from two female friends and her own resources. At the time, she was met with a lot of scepticism from FSPs who didn't think women could run an energy business. She has a supportive partner at home but still must juggle personal and professional responsibilities.

She has a business degree and has started other businesses in the past. She seeks out information on how to better run and grow her business, including sources of investment and grant capital through her own research. Her clients are both households and businesses. As of mid-2022, the business has 217 clients, 75 of whom are women. Her business model is based on working with agents who are part of the communities where her clients are located. The agents are trained on product maintenance and servicing so that they can provide after-sales services. They also help identify new clients for the business and assist in collecting repayment installments. She has continued to refine her business model through a trial-and-error process. In the last year, she was able to get a COVID-19 relief grant and has recently won another challenge grant. She wants to grow her business across the country and expand to neighboring countries but requires investment capital, which is not easily accessible.

Financing Journey

- She did not want to take a loan due to the high interest rate, but at some point, she considered it and consulted several financial institutions. She did not come across any products specific to RE or women entrepreneurs and was told that her ticket size of about $100,000 USD was too small for the FIs.
- She financed the start-up of her business with bootstrapping and help from her network, but she eventually was able to secure grants. It was very challenging to manage her consulting work (for income), run the company, and care for her family while also applying for grants (national COVID-relief fund, African women in tech innovation grant, international RE sector grant). Thus, she decided to hire someone to do the grant writing.
- She gets her information about financing through her network and through staying up to date with the sector.
- She does provide financing to customers and uses the local sales agent model to follow up on reimbursement.
- She received some non-financial services advice on her business model that she found helpful to become investment ready, and she wants more training in this regard.

THE PRAGMATIST

Female | 35–42 | Family includes husband and five children | Livestock agri-business | RE Technology: Bio-digester and bio-gas heater | Lives in a rural area close to a city in southern Africa | Sector: Renewable Energy

Background

The Pragmatist is focused on the well-being of her family and works with her family members to run her livestock agri-business. She has always managed the household budget. She saves some of her funds through a savings group, and even though she wants to help grow her family income, she does not feel comfortable taking a loan from anyone but her family and friends. She grew up on a farm and has knowledge of animal husbandry and livestock management. She has seen how not having a reliable heating source can lead to animal deaths and loss in income during the cold winter months. She is aware of an opportunity to use a bio-digester for heating, which seems a lot more efficient than the firewood heating she currently uses. However, raising the required up-front investment is a challenge. She is determined to find the necessary resources, as she knows that bio-gas heating will help her grow her business and increase income for the entire family.

Business Journey

The Pragmatist started her current livestock business approximately three years ago, after the family farm no longer generated enough money to feed her family. Because she grew up on a farm herself, she is very comfortable raising animals and now supplements the household income through the sale of eggs to her neighbors. She had seen her family use firewood for heating to keep the animals warm in winter and has continued using this method, as her farm is not connected to the national electricity grid and probably won't be anytime soon.

A few years ago, through her savings group, she received training on how to expand her brooding business beyond personal consumption. With support from her husband, she decided to focus on growing this business, especially now that her children are older and her son has moved to the city and is able to send some money home. One of her neighbors recently got a bio-digester installed and is now able to turn their animal waste to manure and use bio-gas for more efficient cooking. She even bought a bio-gas heater. The Pragmatist realized that the bio-digester could help grow her farm's income significantly and also save her time on cooking and collecting firewood. Twelve months ago, she finally had the funds to make the initial deposit for a small bio-digester that will produce enough bio-gas to power a cookstove, a heater, and several lanterns. Since receiving the equipment, she and her two teenage daughters have been able to reduce time spent on cooking and firewood collection to focus more on their animal husbandry business. In addition, they built a new heated outdoor enclosure for the animals using the bio-gas heater.

With fewer COVID restrictions now, she is hoping to be able to sell more of her animal products in the nearby local markets. She aspires to grow her business to one day be able to sell in the larger town market. She would also like to purchase a bio-gas refrigerator so that she can store her products longer and sell when prices are better. She knows that her son may not be able to send money home forever and that she needs to find other ways to raise the capital needed for investment.

Financing Journey

When the pragmatist and her husband first decided to focus on animal husbandry as their main business, she financed her business in multiple ways: by selling their farming produce, borrowing from friends and family, and using her savings group share-out funds. She did not want to take a loan from the local MFI because she was concerned that if her business did not do well, she would be stuck with the debt. About 18 months ago, when she first learned about the bio-digesters, she was excited but soon worried that she would not be able to afford a product costing almost $1,500. When the local sales agent explained that she only needed to provide a 30 percent deposit and could pay the rest in installments over a period of 12 months, she started to set aside the money she received from her son from his work in the city as well as some of her business profits to pay for the deposit. The sales agent also explained how the bio-digester is extremely cost-effective over the long run, since the average life of a unit is more than 30 years. She finally made the purchase 10 months ago. The bio-gas heater was very critical in the cold months last winter, allowing her to keep the animals warm and to continue to sell her products in the market. She is now saving to buy additional bio-gas heaters and a bio-gas refrigerator so that she can further expand her business. The support from her son and husband in financing and running the business has also allowed her to dream about owning a much larger business that her children can run. She wishes there was a way she could get additional support—both financial and sales support—but is not sure whom to contact. She has heard that bank and MFI loans require a lot of documents and a collateral guarantee, which she does not have. She also doesn't think banks and MFIs would be interested in serving people like her, since they would consider her financing needs too small.

Segmenting the women's market. In recent years, there have been many new funding initiatives to support increasing women's participation in the renewable energy sector as value chain actors or end consumers. Consequently, several OGS and cookstove focused companies have increased the number of female sales agents or end consumers by investing in developing innovative outreach models or by targeting households. Nevertheless, programming and finance initiatives for WMSMEs in the renewable energy sector have been designed and delivered treating women as a homogenous group, with no apparent variation in approach even for WMSMEs. It is an important first step to see where women might be missing or underrepresented in renewable energy distribution channels and consumer bases. But women as a category is not specific enough to be actionable. Segmenting customers allows businesses and financiers to better understand who their current customers are, so that they can target marketing efforts to bring onboard similar customers. It also helps to identify trends in needs or constraints so that financial products can be designed with these in mind. For example, a segmentation exercise that disaggregates female customers by individual vs. enterprise clients may reveal that WMSMEs are not well represented in their consumer portfolios. This discovery would allow them to concentrate sales and financing efforts on WMSMEs, a segment that may be better able to qualify for financing and make repayments more consistently.

There are numerous ways to segment the WMSME market itself, with many FSPs outside of the sector using turnover, entrepreneurial experience, subsector, financing needs, or other behavioral characteristics to better understand their current customer base or to target new customers. For example, the subsector (SHS, solar lanterns, solar appliances, improved cookstoves, PUE in agriculture) in which a WMSME operates may be critical to understanding preferences and needs. Distributors who predominantly sell solar lanterns or cookstoves not only will have different working capital needs and time horizons than distributors of higher value goods, but they may also be more sensitive to interest rates charged by financial institutions because they have lower-margin business models. Thus, if women distributors are concentrated in lower-margin products, then understanding the subsector's unit economics is key to designing more tailored financing for these women instead of using a one-size-fits-all approach.

However, for WMSME consumer financing for PUE assets, segmenting WMSMEs by other characteristics such as entrepreneurial experience may be a useful exercise since the strength of business plans has been found to be a key success factor in PUE lending.[70]

The importance of segmenting for FSP partnerships. Many renewable energy programs that have focused on women have either (a) identified and trained nascent female renewable energy entrepreneurs to link to finance, or (b) directed outreach to a heterogenous group of existing and fledgling entrepreneurs. Both approaches have had difficulty in facilitating access to finance because WMSMEs were not segmented.[71] While programs aimed at expanding the participation of

70 Pueyo, Ana, and Mar Maestre. "Linking Energy Access, Gender and Poverty: A Review of the Literature on Productive Uses of Energy." Energy Research and Social Science, Volume 53 (July 2019): 170–181. https://www.sciencedirect.com/science/article/pii/S2214629618306145

71 Findings from research study and key informant interviews

women in the renewable energy sector are certainly needed, the ability of these programs to successfully link large numbers of female entrepreneurs to financing (apart from grant funding or highly subsidized guarantee programs) was hampered by high diversity in credit readiness, low WMSME demand for formal finance, or variability in the risk preferences of the female entrepreneur partners.

Further segmenting WMSMEs is important not only because the bankability of new WMSMEs differs greatly from that of existing and more established WMSMEs, but also because capital needs do as well. Another potentially important criteria for segmenting WMSMEs apart from entrepreneurial experience is the specific subsector in which WMSMEs are operating. For example, if WMSMEs in the renewable energy supply chain are clustered in product subsectors such as clean cookstoves where the profit margins are extremely thin, it may not be financially viable to take on debt financing at prevailing market rates, since the margins on sales may not be enough to cover the debt interest. Since the unit economics for clean cookstoves are very different than those for solar appliances, segmenting and understanding the target client group (WMSMEs, in this case) is critical to understanding where opportunities lie. This will help ensure that there is WMSME demand for products and that credit terms offered make financial sense for all parties.

Segmenting PAYGO financing models. As highlighted earlier, missing sex-disaggregated data on PAYGO's promise as a more affordable form of finance for RE goods and services limits the understanding of how accessible PAYGO is for WMSMEs. As noted in CGAP's "Examining PAYGO Solar Through a Gender Lens: An Exploratory Study," providers' lack of a gender-targeted sales strategy is a supply side impediment to uptake by women: "[T]hey don't treat women customers as a distinct customer category even though they have unique product preferences, risk appetites, repayment and default rates."[72]

The importance of segmenting for productive use of energy (PUE). According to the Last Mile Distribution State of the Sector update for 2022 by the Global Distributors Collective, there was a 29 percent increase in the number of distributor members who reported selling PUE products from 2019 to 2022. However, a recent literature review reflected that PUE approaches in the market are typically gender blind.[73] Importantly, analysis of the subsector concentration of WMSMEs suggests that women's enterprises are more predominant in less energy-intensive sectors like agriculture, personal services, food preparation, and retail trade.[74] The evidence review also found that WMSMEs often need additional non-financial services support, such as business plan refinement, to ensure that PUE investments produce the business profitability impact needed for repayment.[75] Confirming these findings, the team did not find any evidence of PUE-focused RE firms conducting research to refine product offerings based on the needs of WMSMEs. As a consequence, PUE investments may not be as productive for all WMSMEs. Acumen's "Bridging the Gap" report recently

72 Kumaraswamy, op. cit.
73 Pueyo and Maestre, op. cit.
74 Ibid.
75 Ibid

highlighted recognition of the need to refine support strategies for PUE-focused RE firms after income generation was lower than expected, with only 17 percent of customers using their energy products for income-generating activities: "Going forward, our investment strategy will focus on PUE models that are designed to increase incomes and resilience in low-income communities."[76]

"Gender considerations have broadly escaped the debate on how electricity impacts enterprises. The energy and gender literature has instead focused mainly on the household realm, where women suffer heavily the burdens of energy poverty."

From Linking Energy Access, Gender and Poverty: A Review of the Literature on Productive Uses of Energy, 2019

Opportunity 1: Donors should support and provide technical assistance to initiatives to segment women's entrepreneurship, especially those including an access to finance component, in order to screen WMSMEs for interest and eligibility criteria when credit products cannot be refined.

D. Refining Financial Services Offerings for WMSMEs in the Renewable Energy Sector

As the scope of this research focused on finance for WMSMEs active in the sales or distribution of renewable energy products or WMSME customers financing PUE assets, the team surveyed the market, reviewing financial product offerings by renewable energy financiers and impact funds.[77] However, the findings were scant, with a few notable exceptions. Included in the research are several additional modified approaches that do not yet offer a business case or best practice for financing WMSMEs in the RE sector. Since they either rely on heavily subsidized business models, have high degrees of intervention from non-market players, do not differentiate women customers by enterprise, or have not yet demonstrated a proven business model, these examples are provided to illustrate that some sector actors are testing models.

Smaller deal sizes. Often falling into the missing middle, WMSMEs have cited challenges with finding financing that meets their needs. Driven by high due diligence costs and lengthy processing times, the minimum deal sizes of many impact funds and financial institutions are often too large for WMSME needs/preferences, while microfinance loans are too small. The majority of renewable energy-focused impact funds had deal sizes of €500,000 to €3 million, which was well beyond the demand for even the larger more established WMSMEs interviewed.

76 Labruto, Leslie, et al. "Bridging the Gap—What We Learned from Pioneering the Next Wave of Energy Access." Acumen Energy. 2022. 20.
77 Among those funds reviewed were Acumen, Alitheia IDF Managers, Acumen KawiSafi Ventures, Africa Enterprise Challenge Fund, CAMCO Renewable Energy Performance Platform, EDFI ElectriFI, EEP Africa, Gaia Impact Fund, GroFin, ResponsAbility, Triple Jump, SunFunder, InfraCo Africa, SIMA Angaza Distributor Finance Fund, and Wangara Green Ventures.

Reducing Collateral Requirements—Example from Outside the Sector

In Ethiopia, the Women's Entrepreneurship Development Program utilized alternative credit criteria provided by LenddoEFL's psychometric scoring to increase lending to women's enterprises. By demonstrating that entrepreneurial attitudes and propensity to repay could be measured by WMSMEs' responses to survey questions in lieu of collecting collateral, the program helped to encourage greater lending to women's enterprises. The program also provided technical assistance to MFIs to improve cash-flow-based lending, which culminated in FSPs recognizing alternative forms of collateral, like business inventories, vehicles, and personal guarantees, and reducing collateral requirements from 200 percent of loan value to 125 percent. Please refer to the financial services provider case study (Case Study 1) in Section VIII for more information.

The one notable exception was the SIMA Angaza Distributor Finance Fund (DFF). For SIMA Angaza Distributor Finance Fund, the key to providing debt financing for its target distributor client base was to reduce deal sizes. By targeting distributors already linked to the Angaza customer management solution, the Fund was able to streamline the due diligence process with respect to data gathering, verification and credit assessment and solve the challenge of reducing deal sizes. By using the digitally enabled data for sales and asset quality from the Angaza technology platform, the Fund reduced transactions times and costs to underwrite smaller ticket sized loans.

The fund has adopted 2X Challenge criteria and focuses on financing entities that are (1) increasing women's participation in leadership and employment, and (2) adopting gender-equitable policies and pay. Sima DFF also prioritizes investment for women-led and/or women-founded companies within its criteria even if any other financial criteria is not met. By offering debt financing with ranges from $50,000 to $1 million USD with up to four-year terms, the fund has achieved 10 percent representation of WMSMEs in its portfolio. It has also been able to exceed 2x Challenge Criteria for women's leadership, across its entire portfolio, with 60% of DFF investees having 33% or more women in senior leadership positions (compared to 20%-30% 2x Challenge Criteria thresholds).

PUE asset financing with modified down payment amounts. Several initiatives have been testing how to reduce the up-front down payment required for financing productive assets. For example, Energy 4 Impact has piloted various leasing models and tested different percentages for the up-front payment for the purchase of solar freezers for women's agricultural processing associations. Modest program results, even with a partial program guarantee, and heavy facilitation by the INGO, make it difficult to promote this as a replicable model, despite the high rate of satisfaction by the women business group customers. The Centre for Rural Technology, Nepal (CRT/N) worked with central and local banks to facilitate access to affordable credit for productive uses of energy asset purchases between 2019 and 2021 for nascent female entrepreneurs in support of the Nepali government's policy mandate to provide low interest credit to women entrepreneurs. Overall, the project linked 218 nascent female entrepreneurs to local financial institutions, including the Agricultural Development Bank Limited (ADBL, an autonomous bank largely owned by the government of Nepal. ADBL was one of the main partners of the project, funding 81 out of 218 female entrepreneurs for a total loan amount of NPR 166.71 million ($1.44 million USD), at relatively low interest rates ranging from 2.5 to 6 percent. To address documentation constraints of the nascent female entrepreneurs, CRT/N and the project team engaged rural municipalities to ensure women were able to obtain documentation needed for loans. Cognizant of women clients' distances and time constraints, ADBL staff also travelled to remote locations to help women entrepreneurs complete credit assessments, While the results to date are promising, the level of support provided by the CRT/N and project team in preparing women entrepreneurs, and a supportive national policy environment are difficult to sustainably replicate. Both items were critical to incentivizing financial institutions to lend to new or fledgling women entrepreneurs, but are not always present in other countries and markets.

Group liability models to eliminate collateral requirements. Several projects have adopted a group liability model, through either village savings and loan associations or community-based group models. For Bidhaa Sasa, a social enterprise that finances low-income rural women in Kenya to purchase low ticket item household assets (around $100 USD), a group liability model was the key to addressing the collateral constraints of target women customers and maintaining affordability. Although assets are financed for individual women, establishing groups of five for the sale helps ensure that the business can achieve some economies of scale while lowering the risk of non-payment. With such small ticket sizes, the company could not invest in extensive credit algorithms or processes.

Below market interest rate loans. The cost of on-lending capital is often a constraint for social enterprises that are providing financing to their supply chain partners. As highlighted in Section VI, WMSMEs struggle to find locally available capital at attractive interest rates to finance their businesses. Using Kiva, a crowd-sourcing platform that offers subsidized capital to social enterprises providing significant impact, RE businesses have been able to access on-lending to finance select WMSME supply chain partners at below market rates. In the case of Solar Sister, entrepreneurs were offered working capital loans at a 0 percent interest rate.[78]

Using credit proxies. USAID's Feed the Future Innovation Lab for Small Scale Irrigation is focusing its efforts on encouraging solar pump distribution firms to utilize different creditworthiness indicators that would be proxies for good credit risk and much easier for women to achieve. They include VSLA membership as a proxy for financial literacy, commercial involvement for their agricultural goods, outside income streams, collecting usage data to determine productivity of assets, and the ability to repay.

78 As reported in ENERGIA's "Supporting Last Mile Entrepreneurs" report, Solar Sister believes there is a conflict of interest in providing non-financial support and women's empowerment services while simultaneously involved in loan giving and debt collection.

Opportunity 1: Utilizing data about financing gaps for women and WMSME customers, donors and impact funds should support renewable energy companies providing finance and FSPs to pilot-test segmented approaches to WMSME finance for PUE and within the supply chain.

E. Facilitating Women's Entrepreneurship Development

For purposes of this analysis, the Distill Inclusion team has separated the discussion about WMSME financing supply trends by social enterprises, which count women's entrepreneurship development as a main business purpose. Because these models often recruit women entrepreneurs directly, they offer substantial business training support and sometimes start-up capital. The literature review identified several social enterprises with a greater focus on women as customers and supply chain actors: Solar Sister, Vitalite, Deevabits Green Energy, Amped Innovation, Sosai Renewable Energies, and SolarWorks!. With business models centered around the sales of household goods like solar lanterns, solar home systems, and improved cookstoves, these enterprises have made investments in expanding women's participation in supply chains by making outreach channels more inclusive, developing women sales agent networks, or deploying digital marketing for female customers.[79] Because these models pay commissions based on sales, they are not providing direct financing but instead work to improve women sales agents' performance and reduce barriers to recruit and retain those agents. While achieving significant results, many of these women-focused initiatives, although impactful, have been resource intensive and relied on subsidies to expand reach and financing.[80]

As discussed previously, the notable exception for financing sales agents is Solar Sister, who is providing highly subsidized, in-kind financing to its entrepreneurs, who sell its products. This is in line with observations from the Global Distributors Collective 2022 "State of the Sector" report, which states that many last-mile distributors (LMD) "tend to rely heavily on grants, partnering with NGOs to run awareness campaigns,[81] since low sales volumes per agent make these entrepreneurs less profitable.

Frontier Markets (FM), a rural e-commerce social enterprise in India, employs women as sales agents. These female sales agents, known as "sahelis," function as last-mile micro-entrepreneurs, selling products (including OGS products) within their villages. FM recruits women who are part of the self-help groups (SHGs) in India, and it provides initial training and onboarding on using the FM app and virtual marketplace. Within 7 to 10 days of signing up, the women entrepreneurs are able to start earning. At present, FM shares its data on sahelis' transaction history with local banks that

79 Value for Women. "Gender in Business: Lessons Learned from Last Mile Distributors." Global Distributors Collective. 2022. https://globaldistributorscollective.org/gender-in-business-lessons-learned-for-last-mile-distributors

80 Solar Sister, Deevabits, and Sosai are all Kiva social enterprise partners, leveraging the platform to provide on-lending capital to finance their women entrepreneur agents.

81 Global Distributors Collective. "Last Mile Distribution: State of the Sector" update. 2022. https://infohub.practicalaction.org/bitstream/handle/11283/622892/GDC%20State%20of%20the%20sector%20update%202022.pdf?sequence=1andisAllowed=y

can lend to SHGs. But it is also in the process of designing a new working capital product with an India-based fintech company and exploring partnerships with other fintech providers as it continues to grow its workforce, which stands at 30,000 sales agents across India as of June 2022.

Opportunity 1: Socially driven NGOs and other enterprises have done a great job of incubating and supporting the growth of new women entrepreneurs. But to scale up the financing available to these women, such programs and projects need to look at market-driven models of financing, such as consignment-based financing or digitally enabled supply chain financing, that can facilitate working capital access without the need for collateral.

VIII Case Studies

Two studies have been developed to provide insights on the demand side needs and constraints for WMSMEs, as well as innovations in supply side financing for WMSMEs and women customers.

In the absence of specific examples from the RE sector of gender-intentional and scalable refinements to financing models, the Distill Inclusion team has created a case study reflecting on the many examples of financial services providers customizing their financial products and non-financial services offerings to better serve WMSMEs.

The second case study involves Bidhaa Sasa, a social enterprise whose customer base is 83 percent low-income women. It highlights the process investments that the company has made that ensure it remains customer centric and knowledgeable about its female customers' constraints. Bidhaa Sasa uses this knowledge to refine its product and financing offerings.

Case Study 1 - Lessons Learned from the Financial Inclusion Sector to Improve Financing for WMSMEs

Emerging lessons learned by financial service providers (FSPs) and women's entrepreneurship/ financial inclusion programs may hold the key to how renewable energy sector financiers can adapt their lending programs to better suit the needs of the two personas described earlier, who represent WSMEs and WMSEs, both of which make up WMSMEs. The following case study presents not only the journey of why these entities decided to redesign their offerings, but also the adaptations in processes that have allowed them to recognize the opportunity. Drawing on those provided by KIT, WEDP, FMO, and the IFC, we have organized these examples by theme, including ***customer segmentation and research, defining return on investment metrics for non-financial services offerings, and alternative credit assessment methodology.*** The result is an amalgamation of best practices and innovative techniques that renewable energy sector financiers can utilize to expand lending and service delivery to WMSMEs.

Customer Segmentation and Research

Customer segmentation has multiple business benefits, including allowing entities to (1) support product development, (2) develop a more effective marketing strategy, (3) predict customer behavior, (4) personalize the customer experience, (5) improve customer retention, (6) optimize the customer journey, and (7) improve conversion metrics from prospective to active client.[82] There are several examples of how financial services providers have used customer segmentation strategies to increase financial product access and usage by WMSMEs.

Access Bank Nigeria. In 2006, Access Bank's interest in targeting the women's market emerged after research revealed a high rate of women's business ownership in Nigeria and a low rate of financial product utilization. During an earlier program in 2006 funded by the IFC, the bank expanded its WMSME portfolio and observed very high rates of repayment (non-performing rate of only 1 percent). Seeing that there was still a lot of unmet need in the women's market, the bank launched its "W" initiative in 2014, which aimed to serve several different female customer segments. This initiative has shown how segmenting the women's market into distinct customer groups can help financial institutions better understand and serve their clients. Drawing from the KIT Royal Tropical Institute's "Insights from Access Bank Market Research" paper[83] and Global Banking Alliance's case study of Access Bank,[84] renewable energy financiers can learn from the bank's experience how it defined female enterprise customer segments and market research to customize financial product offerings, offer non-financial services, and expand its female customer base.

Using three main female customer segments identified after conducting market research with

82 "7 Benefits of Customer Segmentation," https://www.namogoo.com/blog/consumer-behavior-psychology/customer-segmentation/#2
83 Jarden and Rappoldt, op. cit.
84 Global Banking Alliance for Women. "Access Bank: Strategic Women's Market Segmentation Yields Strong Growth at Nigerian Bank." GBA Case Study. 2018. https://financialallianceforwomen.org/download/gba-case-study-access-bank/

distinct groups of Nigerian women across the country (see Figure 9), the bank modified its current offering to fit the needs of each individual segment and address any barriers that each might have in accessing the products.

Figure 9: Access Bank and Nigeria's Target Female Customer Segments

Segment	W Young Professionals	W and Family	W in Business
Target Market	Career-focused women who are at a pre-family stage of their lives and who are not engaged in their own or part-owned business.	Mix of professionally qualified middle and upper middle market women, married with children, consisting of non-working house wives, women who are engaged in professional employment and women who may be engaged in running their own informal micro/ home- based business	Women managing their own micro, small or medium-sized enterprises who are responsible for making most business and financial decisions

Global Banking Alliance for Women. "Access Bank: Strategic Women's Market Segmentation Yields Strong Growth at Nigerian Bank." GBA Case Study. 2018.

Using its "W in Business" entrepreneur profile, the bank redesigned several of its products to meet the needs of this particular customer segment. It adapted its MSME loan to create the W Business Power Loan and the MPower Biz Account. Both products also bundled business support services for enterprises that might not yet be ready to borrow. After three years, the W Initiative grew savings account balances by 46 percent for its different women customers and experienced 58 percent growth in lending to WMSMEs.[85] **The customer segmentation process helped Access Bank gain a better understanding of the specific needs of the WMSME's in their market. They wanted loans and financing but were much more interested in non-financial support. Offering these as a bundled value proposition created goodwill for Access Bank among WMSMEs and was key in creating greater uptake.**

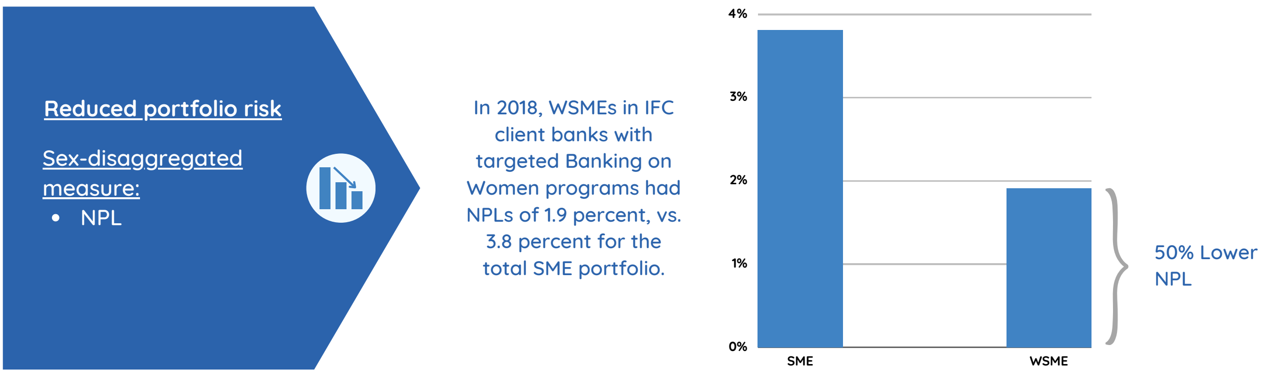
Defining Return on Investment Metrics for Non-Financial Services Offerings

It is now well documented that WSME growth is impeded by multiple cultural and social barriers. The growing awareness of how non-financial services offerings can help overcome some of these barriers has resulted in more FSPs integrating NFS with their financial product offerings. A recent FMO/IFC global survey of 34 banks demonstrated a growing awareness by banks that non-financial services are critical for their SME clients. The study found that 100 percent of banks were providing their SME clients with both information and networking opportunities, while 88 percent were providing access to new markets. The survey also revealed that a large percentage (94 percent) of banks were providing all or some of these services through partnerships. Using education,

85 Ibid.

networking, mentorship, digital/self-service solutions, and one-stop banking experiences, FSPs have been able to address WSME barriers related to choosing less profitable, less capital-intensive sectors, lower likelihood of seeking/using financing for their businesses, lower confidence, smaller networks, time constraints, and social or cultural pressures.

Figure 10: Reduced Portfolio Risk as a Driver of Return on Investment (ROI) for NFS



"Non-Financial Services: The Key to Unlocking the Growth Potential of Women-Led Small and Medium Enterprises for Banks." IFC and FMO joint report. (2020).

Once believed to be a sunk cost, deeper research into five different IFC Banking on Women FSP partners shows how institutions have benefited financially from integrating these services with their banking products. ***Evaluating ROI metrics beyond interest income earned from loans, banks have been able to show positive returns on investment in one to two years. They have done so by measuring how improving relationships with WSME clients resulted in higher savings deposit volumes and fee income due to cross-selling, increased loyalty and lower customer inactivity rates, and reduced portfolio risk, since WSME clients had lower non-performing loan rates than other SME clients.*** As seen in Figure 10, WSMEs from IFC Banking on Women partner banks had lower non-performing loans when compared to the total SME portfolio. Another example of this in practice is ACBA Bank in Armenia, which found that between 2016 and 2018 the costs for its business training program for WSMEs were covered by a factor of 2.5 after accounting for increases in loan revenues and increased customer loyalty.

Alternative Credit Assessment Methodology

Under the Women's Entrepreneurship Development Program (WEDP) in Ethiopia, financial services providers introduced psychometric loan scoring, an alternative credit assessment process to expand lending to growth-oriented women-owned/-led micro and small enterprises (WMSEs).[86] The new credit assessment methodology created a universal credit score for borrowers based on a 45-minute

86 Program eligibility also required WMSEs to be in business for at least six months prior to participation.

questionnaire that "evaluates the entrepreneur's personal attributes, including locus of control, fluid intelligence, impulsiveness, confidence, delayed gratification and conscientiousness."[87] Representing only one part of the broader WEDP program, the intention of the new technology was lowering barriers to credit for WMSEs, which had been unable to meet lending criteria due to structural and cultural barriers, and providing a reliable way for banks to assess credit risk beyond their traditional criteria. The program also included a sizable credit line of on-lending funds for other participating MFI partners, provided by donors to institutions interested in expanding lending to an underserved market that was not typically their customer, as well as technical and financial support for overhauling outdated IT infrastructure.

"WEDP provided a stable anchor from which to innovate, including drawing on financial technology (fintech) as a means to maximize the operational efficiency and effectiveness of lenders, while relaxing collateral constraints for women entrepreneur borrowers. The success of introducing a non-traditional credit assessment methodology to a low-tech and low-literacy environment like Ethiopia stirred enthusiasm and buy-in from the financial sector."

From "Designing a Credit Facility for Women Entrepreneurs: Lessons from the Ethiopia WEDP," World Bank 2020

In Ethiopia, growth-oriented WMSEs faced the typical dilemma of needing more capital than microfinance institutions (MFIs) would provide (uncollateralized group loans with a maximum amount of $1,500 USD), but lower than the typical $50,000 USD threshold for commercial banks in Ethiopia (which require high amounts of collateral).[88] Perhaps even more important, women entrepreneurs were perceived as riskier clients by financial institutions due to specific structural and cultural barriers, such as less education, shorter business and banking histories, and few to no assets in their name. This made it difficult for them to qualify for larger individual business loans.[89] Other contextual challenges, such as the absence of a credit bureau in Ethiopia, meant that financial institutions had significant difficulty evaluating the creditworthiness of potential borrowers.[90]

87 Alibhai, Salman, et al. "Disruptive Finance: Using Psychometrics to Overcome Collateral Constraints in Ethiopia." World Bank. Washington, DC. 2019.

88 Though offering uncollateralized group loans, MFIs in Ethiopia typically had a maximum loan amount of $1,500 USD, well below the financing needs of the WMSEs the program targeted. Meanwhile, Ethiopian commercial banks offered much higher loan amounts for individual businesses but had an average minimum loan size of $50,000 USD that required high amounts of collateral.

89 Alibhai, Aly Salman, Mengistu Bessir Achew, Francesco Strobbe, and Rachel Dawn Coleman. "Designing a Credit Facility for Women Entrepreneurs: Lessons from the Ethiopia Women Entrepreneurship Development Project." World Bank. Washington, DC. 2020. https://openknowledge.worldbank.org/handle/10986/34013

90 Given the lack of information on borrowers in Ethiopia, banks historically required collateral worth three times the value of loans to minimize their exposure and risk.

The Technology and Results

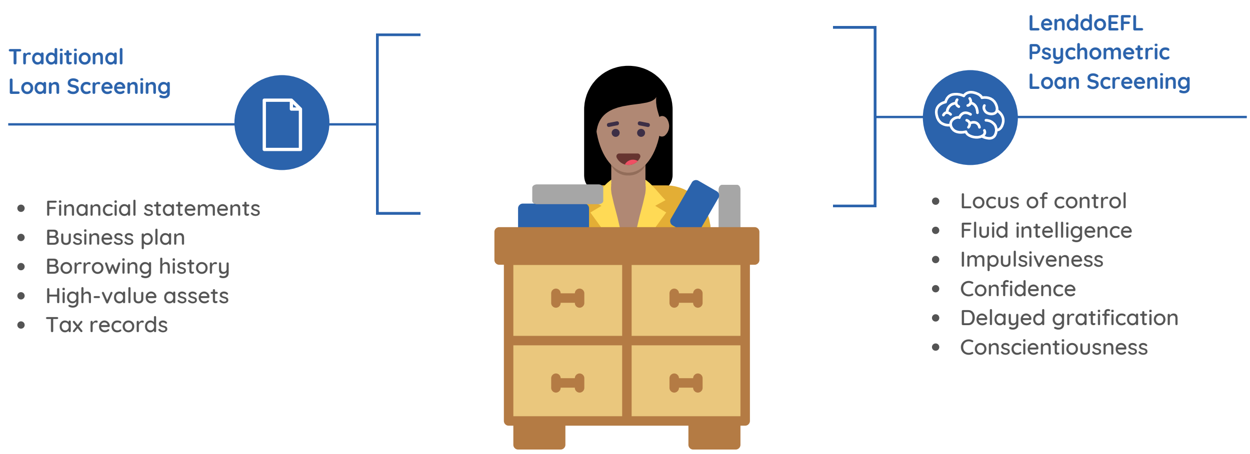


Figure 11: Comparison of Loan Screening Criteria from WEDP Ethiopia.

As Figure 11 shows, the psychometric assessment represented a departure from traditional loan screening criteria, such as credit history, reliable financial statements, and high-value assets, which women-owned micro and small enterprises often lack.[91]

Making the transition to a new credit assessment methodology was not immediate or without challenges. **To overcome FI concerns about the reliability of the psychometric testing in the new market of Ethiopia, the technology was pilot-tested with one MFI partner who did not initially use the LenddoEFL scores to make credit decisions. Instead, the scoring was done in parallel with traditional credit assessment, and tested borrowers were monitored to see how well LenddoEFL credit scores predicted credit repayments.** After a 17-month pilot, the results showed that "[c] ustomers who scored higher on the test were seven times more likely to repay their loans compared to lower performing customers."[92]

Although requiring a significant shift in business operations, the pilot-test provided a demonstration case for other MFIs interested in expanding their loan portfolios and making their loan processes more efficient. To date, two additional MFIs have begun utilizing the psychometric testing. Together with the results from the larger WEDP credit line program, financial institutions began to utilize their own limited capital to expand lending to this important female customer segment.

91 Alibhai, Aly Salman, et al., op. cit.
92 Alibhai, Salman, et al., op. cit.

Other notable WEDP findings with applicable knowledge for the RE sector:

- Women entrepreneurs who received loans had different characteristics than those who did not qualify, including being older, having a higher educational attainment, having larger business sizes, having greater household asset wealth, and scoring better on measures of entrepreneurial identity and locus of control as a proxy for higher entrepreneurial capabilities.
- After experiencing excessive demand for loans from WMSEs and seeing the demonstration case that WMSEs were high-value customers with high repayment rates, participating FSPs also expanded the project with their own internal funds. As of December 2019, the WEDP program had provided loans totaling $158.1 million USD to 13,870 WMSE clients. Donor funds provided 59.8 percent, and MFI internal funds provided 26.6 percent. The remaining 13.6 percent were from the revolving fund created by the project.
- In terms of impact, larger individual-liability loans offered to growth-oriented women entrepreneurs significantly accelerated their business growth and boosted employment levels, with loan recipients' incomes increasing by 67.89 percent from the baseline and employment increasing by 58.6 percent.

Applying the Lessons Learned and Best Practices in the Renewable Energy Sector

So, what can the financiers in the renewable energy sector learn from these strategies and best practices in the financial inclusion sector?

- Customer segmentation is key to better understanding the women's market. Since women are not a homogenous group, financiers should identify who they are trying to serve, with their distinct needs, characteristics, and barriers to inform outreach strategy, potential product modifications, and non-financial services offerings. To expand finance options for the different segments of WMSMEs in the renewable energy value chain, entities will benefit from performing customer research to identify and target subgroups within the women's market. Based on this research, financiers may find that some WMSMEs are more interested in finance and able to meet existing eligibility requirements, or the research may illustrate where modifications are needed to increase their participation. For example, if market research shows that a large percentage of WMSMEs are concentrated in lower-margin businesses, financiers may want to consider tailoring their interest rates to be more responsive to the subsector's needs.
- Non-financial services can be offered sustainably for WMSMEs, but that requires entities to (1) segment their offerings based on needs, costs, and/or impact, and (2) evaluate other profitability metrics beyond interest income to determine how WMSMEs contribute to the bottom line. NFS offerings have been used to reduce the barriers that WMSMEs face and can help prepare them for accessing and using financing to grow their business. Banks have also found that the partnership model is a cost-effective way for providing these business support services. Providers can utilize technology or alternative credit assessment methodologies that are just as effective as collateral-based risk predictors to make available financing for WMSMEs that face specific barriers in meeting traditional financing criteria.

Case Study 2 – How Bidhaa Sasa's Customer-Centric Approach Serves Its Primarily Female Customer Base

Bidhaa Sasa is a last-mile finance and distribution company that brings products like solar lanterns, solar home systems, improved cookstoves, agricultural tools and storage solutions, and other household goods to a predominantly rural, low-income female customer base. The company operates in western Kenya and Uganda and has over 90,000 clients, 82 percent of whom are female.[93] Despite its smaller size, the company provides an example of how last-mile off-grid solar companies and financiers can use a customer-centric approach to adapt products and services to better meet the needs of women enterprise clients. The following case study highlights several key elements in the Bidhaa Sasa model that have allowed the social enterprise to recognize when and where adjustments should be made to help facilitate financing for its female customers.

Building a Financing Model around Female Customers

Bidhaa Sasa began by recognizing an underserved market opportunity: Even though they represented more than 50 percent of the population of Kenya, rural women were not being served by traditional retailers or agro-dealers, especially when it came to goods on credit. Theoretical barriers to serving rural women in western Kenya have included lack of income, household decision-making power, and significant farm size. However, when the company conducted its own research, it found that many of these assumptions were inaccurate. ***While women in rural western Kenya faced mobility and time constraints, lacked collateral or significant credit histories, and had barriers to accessing information about new products/services and financing, their incomes and their roles in farming and household purchase decisions were grossly underestimated.*** This has been confirmed throughout Bidhaa Sasa's business journey. When asked who makes the installment payments and who uses the product purchased, most of the company's female clients said that they do.[94] Though the women's incomes were often smaller than men's, they still had income to purchase trusted products that had a significant value proposition for themselves or their households. More importantly, the company realized that women's strong social networks were also an untapped resource, built upon significant trust, steadiness, and positive attitudes. This was a compelling rationale for building a business around this targeted customer segment. With this knowledge, the social enterprise set out to design its product outreach and financing models to overcome the three main validated barriers from its research—affordability, product awareness, and access to finance—as well as take advantage of the targeted customer segment's strengths.

93 60_decibels. Bidhaa Sasa Impact Report. May 2022.
94 Bidhaa Sasa. "Product Testing and Diversification of Bidhaa Sasa's Range of Products Sold on Credit." MEDA INNOVATE Final Report. 2020.

Leveraging the robustness of women's existing social networks, Bidhaa Sasa's marketing outreach and financing model are organized around group leaders from the community. These leaders, of whom approximately 78 percent are female, are recruited, trained, and supported by the company's field staff, who focus on building their capacity to organize product demonstrations, recruit new clients, and assemble financing groups based on demand and trust.[95] "Clients promote[d] our products, which led to community members better understanding how they could benefit from our products, whether it be spending less time preparing meals, saving more money on fuel, or improving their health by using improved cookstoves."[96] Its financing model relies on a group liability model, with products acting as collateral and group members of seven or more co-guaranteeing loans, which allows for maximum participation of women. Groups are typically a mix of male and female clients, even though the majority of Bidhaa Sasa's clients are female. Using group repayment methods has allowed Bidhaa Sasa to mitigate its credit risk, since groups are less likely to default than individual borrowers.[97] Over time, its distribution approach of primarily women group leaders serving women customers has paid off. ***"[Over] 80% of our 90,000 clients have been recruited by existing clients, making client acquisition and distribution more cost-effective and more women-friendly than traditional agent-based models."***[98] By focusing its model on groups, the company has taken a perceived disadvantage (lack of collateral) and turned it into a business advantage.

Refining the Financial Model and Finding the Right Customer Product Fit

Customer centricity and a culture of adaptation are in the company's DNA. In addition to using its initial customer research to identify the most accessible model for women customers, the company relies heavily on the feedback it solicits and collects along the customer's journey. To this end, selecting the right products to stock and sell is essential. Since many female clients are learning about and accessing products for the first time, it is particularly important for Bidhaa Sasa to build customers' trust in the product and in the institution itself. In its testing phase, Bidhaa Sasa allows existing clients to try out the product for a few days or weeks in order to collect feedback from users about quality,

> "I don't have anything in common with my customers, so how do I overcome that handicap? I have to do a lot of research. If you're not customer-centric, then you don't have a business case."
>
> *Rocio Perez-Ochoa, Co-Founder and Director, Bidhaa Sasa*

95 Ibid.
96 Brandon, Allegra. Interview: "Bidhaa Sasa: Leveraging Social Networks to Reach Last-Mile Consumers—Even during a Pandemic." Clean Cooking Alliance. April 2022. https://cleancooking.org/news/bidhaa-sasa-leveraging-social-networks-to-reach-last-mile-consumers-even-during-a-pandemic/
97 International Center for Research on Women. "Gender Smart Investing: Off-Grid Energy Case Study: Bidhaa Sasa." 2018. https://www.icrw.org/wp-content/uploads/2018/12/ICRW_Bidhaa-Sasa_CaseStudy.pdf
98 Interview with Rocio Perez-Ochoa, Bidhaa Sasa co-founder and director, September 2, 2022.

performance, value, and satisfaction with the product.[99] This helps the company to select only products that are valued by potential customers and have market potential.[100] By utilizing demonstrations and trial periods to test products, Bidhaa Sasa's model overcomes the awareness gap that many of its women clients face and helps to reduce any trust gaps for new technologies. ***"At Bidhaa Sasa, we have found that the products that directly save the end user time and/or money and make their work easier have strongest demand and good repayment rates."***[101]

Figure 12: Illustrative Example of A/B Pricing Test for Piloting Agricultural Products

Price List A

Product	Total paid by customer	Number of monthly installments	Monthly installments ($)
1 canvas + 4 PICS bags	$42	5	$8.40
Silo	$108	8	$13.50
Water tank (1000L)	$140	10	$17.50
Sprayer	$84	6	$14.00

Price List B

Product	Total paid by customer	Number of monthly installments	Monthly installments ($)
1 canvas + 4 PICS bags	$45	8	$5.63
Silo	$117	12	$9.75
Water tank (1000L)	$144	14	$10.29

From Product Testing and Diversification of Bidhaa Sasa's Range of Products Sold on Credit." MEDA INNOVATE Final Report. 2020.

One way that the company has sought to address its female customers' affordability constraint is to focus mainly on goods with a price point around $50–$100 USD. ***Before commercially launching a product across all of its branches, it finetunes pricing by performing A/B pricing tests with different repayment plans, testing the options at one or two branches.***[102] This allows the company to measure which option is preferable and manageable for its clients. As seen in Figure 12, differences in pricing are subtle but important for the company's extremely price-sensitive, low-income clients. Based on its customer research, Bidhaa Sasa has found that monthly installments of around $7 were manageable for most clients. However, they also found that extending the loan term beyond 12 months, even to lower the price, was not preferred for many products since many of the women and their families rely on cyclical farming income.[103]

Leveraging Data and Building Customer Feedback into the Model

99 "Product Testing and Diversification of Bidhaa Sasa's Range of Products Sold on Credit." MEDA INNOVATE Final Report. 2020.
100 Yoon, Clara, et al. "Starting Small: Pathways to Customer Centricity." MEDA INNOVATE Learning Series. 2017. https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/57644/IDL%20-%2057644.pdf
101 "Product Testing and Diversification of Bidhaa Sasa's Range of Products Sold on Credit," op. cit.
102 Ibid.
103 Ibid.

Bidhaa Sasa's customer research team has a small footprint in terms of dedicated personnel (only two). But by integrating the collection of customer feedback and preferences into its processes and field work, it has been able to gain a greater understanding of its target customers' preferences, satisfaction, and product needs more efficiently. The company strategically uses its data to highlight areas for further improvement or investigation.

Bidhaa Sasa has incorporated customer research into its day-to-day processes by adding customer research questions to Know Your Customer (KYC) application forms and having staff collect data on preferences and products during normal customer touchpoints. This information is complemented by biannual and annual surveys to collect product feedback and to understand customer satisfaction, respectively. The company does this using SMS in order to keep costs down. It also leverages the knowledge of group leaders, who are closer to customers, by prioritizing periodic conversations between field staff and leaders to supplement understanding about end-consumers.

Bidhaa Sasa has gained important insights from this research that has helped it make better business decisions. In Kenya, it learned that women customers are, in fact, the key purchasers of products and are responsible for repayment, and that they prefer peer-to-peer engagement to learn about new products or troubleshoot challenges. Having found a higher repayment correlation for products that save time/money in the data, the company uses this criterion for selecting new products. Using annual surveys to better understand their clients, the company found that 30 percent of respondents said that they utilize their new household goods (solar home systems for phone charging, LPG and charcoal stoves) for income generation.[104]

Ways to Reduce the Cost of Customer Research

1. Collect data during natural customer touchpoints.
2. Add customer research questions to KYC forms.
3. Leverage customer knowledge of front-line staff and partners.
4. Analyze existing data to uncover trends and unanswered questions to highlight areas for further investigation.

After reviewing sex-disaggregated product uptake in its portfolio and performing follow-up research, Bidhaa Sasa has uncovered some important trends and behaviors about rural Kenyan women's demand for solar lanterns and home systems. In recent years, there has been a shift in demand away from solar products to clean cooking products. While 68 percent of its solar sales still are to women buyers, total sales for these products have been declining steadily over the last two years. Using biannual surveys, Bidhaa Sasa uncovered that customers are not recognizing as much savings with their solar investments as they are with their cookstove investments. As evidence of this, 92 percent of customers who purchased cooking products saw a decrease in their average weekly spending

104 Perez-Ochoa, op. cit.

(including and excluding payments), whereas only 66 percent of solar customers saw a decrease in weekly spending after accounting for product loan payments.[105] Since it does not yet fully understand the causes for the decline in solar sales, Bidhaa Sasa has been piloting different adjustments to its solar offering to stimulate demand. These include stocking a lower-priced product to address concerns about cost savings and value, changing the brand it sells to see if it is related to brand value, and stocking products with different features. If it is not able to reinvigorate demand, the company may need to make the hard choice of whether to continue stocking these products, since warehouse space is limited and should be used for products in higher demand.

The importance of customer research and feedback has never been more apparent than during the social enterprise's recent expansion into Uganda. Using the same customer research tools, Bidhaa Sasa uncovered some key differences between rural female clients in Uganda and in western Kenya, as well as some stark gender differences. For example, in western Kenya, agricultural and cooking solutions dominate demand, whereas in Uganda, demand for solar products was much higher at 33 percent.[106] Moreover, the team is also finding that their rural Ugandan women customers have additional constraints. Since all of Bidhaa Sasa's loan repayments are collected using mobile money, the model relies on a sufficient level of awareness, adoption, and comfort using the digital platform. While it has not been a problem in Kenya, where awareness and usage of mobile money has been high among female customers, women's awareness and usage are much lower in Uganda. This new customer insight is requiring the company to revise its customer education and outreach materials, as well as group leader and staff training, to focus on developing more digital financial literacy to reduce this gap.[107] These insights demonstrate how critical research has been to uncover key constraints, preferences, and behaviors and to refine financial and product offerings for target customer segments.

Bidhaa Sasa utilizes the performance metrics it tracks to create actionable information about how it is serving specific customer segments. Dispelling the myth that female loan clients may pose more risk than male ones, Bidhaa Sasa's sex-disaggregated portfolio data have shown no difference between male and female clients' repayment behavior. Both have strong levels of repayment, likely due to the strong value proposition of the company and its products. With grant support, the social enterprise has worked with 60_decibels to look at the percentage of its customers who are accessing a technology for the first time, how customers rate value for their money, and how customers rate working with the company through a customer effort score. As an example, the company found that 85 percent of female customers surveyed reported being first-time users of a product, as compared to 79 percent of male clients, suggesting that it was reducing barriers to entry for female clients.[108]

Not only does Bidhaa Sasa sex-disaggregate customer and portfolio data to look at differences and similarities among female and male clients, it also sex-disaggregates net promoter scores to ensure

105 60_ decibels. Lean Insights for Bidhaa Sasa Report. May 2022.
106 Global Distributors Collective. "How to Scale Your Last Mile Distribution Business into a New Country Using Lean Start-up Principles." Bidhaa Sasa Case Study Presentation for GDC innovation How-to-Guide Series. September 2021.
107 Perez-Ochoa, op. cit.
108 60_decibels. Lean Data Insights for Bidhaa Sasa Report. June 2020.

that customer satisfaction, likelihood of customer referrals, and customer complaint resolution are balanced among its clients. Aware that sex differences are not the full story, the company also groups customers by product purchased (solar vs. agriculture vs. cookstoves) and geographic location. Its recent work with 60_decibels highlighted a trend among cookstove sales by income level that the company needs to investigate further. Based on the data, the company has found that its cooking product sales tend to be to higher-income clients. However, given the range of its products, Bidhaa Sasa intends to analyze this trend by product to determine if this means it is moving away from its target rural, low-income customer segment.

Conclusion

The example of Bidhaa Sasa demonstrates how other last-mile OGS and cookstove companies can leverage customer research and insights to be more intentional in their product and financial offerings in order to increase the percentage of women in customer and loan portfolios. Although many renewable energy technology companies perceive customer research as a costly venture, Bidhaa Sasa has shown how even a small company can do this efficiently by integrating customer research into its operations at various touchpoints and leveraging existing business data. This helps the company to better understand the constraints and needs of its predominantly female customer base. By modifying its financing model to create a group liability model and focusing on affordability or repayment plans, the business has allowed many women to access solar, cooking, and agricultural technologies for the very first time. Its direct-sales, mainly woman-to-woman distribution model has not only reduced its customer acquisition and marketing costs, but has helped reduce trust barriers that might discourage its targeted female customers from making purchases. This insight may be especially important for OGS/cookstove companies looking to expand product offerings to include productive use of energy (PUE) assets since understanding the strongest value propositions for different target WMSME customer segments could be key to successful product uptake.

IX Recommendations and Conclusion for Donors, Practitioners, Financiers, and Investors

Based on the current state of the renewable energy sector, existing knowledge, opportunities, and gaps, the Distill Inclusion team has compiled a list of six main recommendations for donors, practitioners, financiers, and investors.

1. Expanding the Use of Sex-Disaggregated Data

As renewable energy companies become financiers of last resort for their customers and supply chain partners, collecting and analyzing sex-disaggregated data for their financial portfolios will help determine where gaps in financing may exist for WMSMEs and provide the basis for investigating what is driving the differences in financial access. Given that many impact funds and donors have already successfully promoted 2X Challenge principles, resulting in renewable energy firms tracking women's participation in senior leadership, employment, and customer bases, there is an opportunity to expand the collection and reporting of this financing data within the industry. "Collecting sex-disaggregated data about the characteristics and behaviors of their customers, such as take-up rates, frequency and amount of repayment, default rates, preferred choice of product, channel of delivery, etc., can help quantify current levels of access that women customers of PAYGO have across markets, product categories, and delivery channels. It can also help identify existing barriers to access and inform solutions to improve access for women customers."[109]

For impact funds, the business case for collecting sex-disaggregated data should be tied to overall business performance. In interviews, several impact funds and sector representatives noted how portfolio quality was a serious challenge for their investees. While by no means sufficient, sex-disaggregated financing data are a starting point for firms to better understand their credit customers. Accordingly, this will allow them to effectively target new customers, identify where product modifications may be possible and necessary to overcome gaps, and build customer profiles for the strongest credit clients. For industry-wide associations, collecting sex-disaggregated data on customers and financing by sector will spotlight opportunities where significant gender gaps exist. This can help bring further funding and attention from donors and impact funds to support and encourage innovation in financial products by financiers of the renewable energy sector to serve WMSMEs. Since many renewable energy companies and funds are already collecting these customer data during credit assessment processes, applying the same lens to their credit portfolios should require minimal effort.

2. Promoting Customer Segmentation

Based on the key informant interviews and the literature review, very few financiers to the RE sector are currently utilizing a customer segmentation strategy within their businesses. Since women are not a homogenous customer segment, sex-disaggregating financing and sales data have not been very useful to encourage businesses to customize their products, financing, or service delivery. It also has helped to obfuscate viable female customer segments, since women businesses of all shapes, sizes, experiences, and needs have been lumped together. Despite an often-cited challenge of finding new female customers, many renewable energy firms do not appear to be creating specific female customer segments to help them refine sales strategies. As noted by CGAP, "Providers lack gender targeted business strategies. Although women are a customer segment with distinct energy needs and repayment behaviours, providers don't seem to treat them as such."[110] While making the investment may have seemed less important when product lines only targeted households, as the sector expands into enterprise-focused products (PUE), more defined customer groups will also support renewable energy firms' overall goals to expand sales and improve credit portfolios.

Applying the lessons learned from other sectors, financial services providers have utilized segmentation strategies to specify who their target client is to tailor their value propositions to that segment.[111] Furthermore, "an engendered market segmentation study would reveal that different

109 Kumaraswamy, op. cit.
110 Ibid.
111 Jarden and Rappoldt, op. cit.

segments (e.g., youth, entrepreneurs, farmers, migrants) experience various needs and constraints in accessing, using and benefiting from financial services."[112] According to the research of Demirgüç-Kunt and Klapper, Sub-Saharan Africa no longer has a gender gap in terms of access to microfinance for micro and small firms.[113] However, without segmenting to look specifically at WMSMEs at levels above microfinance thresholds, using targeted outreach strategies or customized lending products may not solve for the accurately credit constrained audience.[114] Within the women's financial inclusion sector, financial services providers have used this strategy to modify their product offerings and service delivery, even articulating the business case for the provision of non-financial services to better suit the needs of various female customers.

Impact funds, donors, and other industry leaders have an opportunity to promote tools that demonstrate how renewable energy firms can begin to segment their customers in a simplified way and the value in doing so through their gender or business-focused technical assistance. Throughout the key informant interviews, several firms suggested that they did not have the resources to embark on a customer segmentation strategy or that they felt it would be too time consuming or resource intensive. However, companies can apply very simple custom segments to evaluate product and financing uptake. Guides such as MEDA's "Starting Small: Pathways to Customer Centricity" have highlighted three easy ways that firms have defined customer segments—by demographics, willingness to pay, and clustering algorithms.[115] Beyond demographics, other potential segmentation strategies utilized within the financial inclusion sector for disaggregating women customers include grouping customers by economic criteria, behavioral characteristics, life stages, or business stages.[116]

For industry associations, grouping customers by categories other than by renewable technology purchased will also encourage members to develop or refine product or credit offerings to take advantage of viable but underserved customers.

3. Integrating Gender into Business Impact Metrics

Several impact funds, donors, and international nongovernmental organizations have begun to apply the 2X Challenge framework, asking investees or partners to collect and report gender-impact metrics. Nevertheless, as highlighted in Section VII, Supply Side Considerations and Constraints, many renewable energy firms still view gender as a niche issue, unconnected to their business performance or survival. Significant resources have been invested in supporting companies to improve their gender-impact metrics, encouraging investees or partners to improve women's participation in senior leadership, firm employment, and its customer base. Businesses

112 Vossenberg, S., A. Rappoldt, and J. D'Anjou. 2018. "Beyond Access. Exploring Gender-Transformative Approaches to Financial Inclusion." KIT Royal Tropical Institute, International Development Research Centre and the MasterCard Lab for Financial Inclusion.

113 Demirgüç-Kunt, A. and L. Klapper. " Financial Inclusion in Africa: A Snapshot." 2013. https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Financial_Inclusion_in_Africa.pdf

114 Alibhai, Salman, Niklas Buehren, and Sreelakshmi Papineni. "Better Loans or Better Borrowers? Impact of Meso-Credit on Female-Owned Enterprises in Ethiopia." World Bank Policy Research Working Paper 8511. May 2020. https://openknowledge.worldbank.org/handle/10986/34013

115 Yoon, Clara, Jennifer Ferreri, and Nick Ramsing. "Starting Small: Pathways to Customer Centricity." MEDA INNOVATE Learning Series. 2016.

116 Jarden and Rappoldt, op. cit.

have also co-developed gender-action plans (GAPs), resulting in improved policies and procedures to facilitate a better working environment for female employees, study and reduce wage gaps, and improve female workforce recruitment and retention. In fact, such engendered policy and management changes have been shown to produce significant positive long-term business impacts.[117] These important gender metrics have helped to establish a baseline for the sector and identify areas for investment. However, without full buy-in of renewable energy sector businesses, gender metrics run the risk of being relegated to being a "nice to have" item, but one that does not improve the bottom line. Many stakeholders interviewed also suggested that GAPs often exclusively promote internal policy changes instead of focusing more on improving engagement with women as customers because of the challenges associated with doing so.

Through additional technical assistance, donors and impact funds have an opportunity to support businesses' understanding of how specific female customer groups can contribute to overall business goals. Technical assistance should be focused on adopting more customer-centric approaches, so businesses understand customer needs and can customize product and credit offerings to meet customers where they are. Renewable energy firms may be missing an opportunity to identify which female enterprise customers would serve their bottom line. Since the two most important metrics for businesses are portfolio quality and sales, impact funds and donors should encourage businesses to further disaggregate gender metrics to include evaluating portfolio quality by customer type and customer sales data. As highlighted in women's financial inclusion literature, several financial institutions have begun to look at other business metrics across product lines to show the value that certain female customer segments offer. These include customer retention and cross-utilization of products, which they have found to be higher among certain women customers. They have even shown how FSPs can break even in a short time frame, even while providing non-revenue-generating support services like business training.[118]

4. Expanding the Business Case for Gender-inclusive Financing in the Renewable Energy Sector

Developing a strong business case for gender-inclusive financing is key to maximizing the buy-in by supply chain actors and should connect to the specific business outcomes that are most compelling for the sector—portfolio quality, cross-utilization of products, and customer retention. While renewable energy companies may have a generalized idea of how and why WMSMEs are an important customer segment, connecting this to the potential bottom line by sizing the market and its financing needs would have the most impact in encouraging investment. However, this will require concerted effort and investment to fill the data gaps that currently exist in the sector. As seen in the financial inclusion sector, lack of data limits FSPs in their ability to understand the opportunity to serve women with appropriate products or they may simply not see the opportunity the women's market presents. The renewable energy sector does not currently have aggregate

117 Kumbuli, Najada, Leigh Moran, and Jenn Pryce. "Just Good Investing: Why Gender Matters to Your Portfolio and What You Can Do about It." Criterion Institute. 2018.

118 Jarden and Rappoldt, op. cit.

information on different female customer segments to assess access/usage/credit gaps, size of the gap by type of financial product, internal financial return in terms of customer uptake, drop out, revenue or profit, market size, or an estimate of women's market opportunity (revenue per product, profit per product, usage, cross-selling).[119] Given that unit economics and margin analysis are largely proprietary, those who support the sector are also lacking vital information to understand when financing may be most profitable and effective for WMSMEs. The business case for certain female customer segments as better potential customers is supported by several anecdotal studies, including female off-grid customers having a higher average NPS than men, by as much as 20 points.[120] Also, women tend to perform more favorably in terms of sales, profitability, and job creation when key factors such as industry and business age and size are considered.[121] As highlighted by the recent Value for Women report on the findings from a five year SME pilot study on the business impacts of the adoption of gender inclusive strategies, SMEs that used gender strategies to tackle business challenges reported positive business impacts, 43% of SMEs reported increases in sales revenue, 42% reported increases in customer retention, 68% reported increases in customer satisfaction, 60% reported increased brand recognition.[122]

> "[The] lack of data perpetuates gender gaps. . . . Financial Service Providers have consistently struggled to provide sufficient financial services to women, because they often do not have data needed to develop an accurate picture of the women's market, and therefore cannot build a business case for targeting women or monitor their own performance with the women's market."

From Financial Alliance for Women, The Way Forward: How Data Can Propel Full Financial Inclusion for Women. 2018

5. Providing Technical Support to Make Gender Data Integral to Business Health

Donors and impact funds have an opportunity to solicit sex-disaggregated data for their investees' financing portfolios as part of their gender-impact indicators. Collecting this data is not only helpful for the sector at large but would be beneficial for strengthening company portfolios. Although only a starting point, examining sex-disaggregated data can help RE firms understand who their customers are and how well they are repaying. The analysis may even show that women customers perform better than male ones, as has been shown in SME and microfinance repayment analyses.

119 Ibid.
120 "Why Off-Grid Energy Matters." 60_decibels Impact Evaluation Report. 2020. p. 25.
121 Barron, Manuel, Rowan Philip Clarke, Amanda B. Elam, Rebecca A. Klege, Anita Shankar, and Martine Visser. "Gender and Entrepreneurship in the Renewable Energy Sector of Rwanda." IDS Bulletin, Volume 51 (1). 2020. https://bulletin.ids.ac.uk/index.php/idsbo/article/view/3074/3062 p 54.
122 Value for Women. "Driving Growth and Improved Business Performance, The opportunity of investing in gender inclusive strategies." (2022). https://shellfoundation.org/app/uploads/2022/10/Gender-Report_VFW-Revised_Oct.pdf

While it is clear that women are not benefiting equally from investments in renewable energy, the sector and its supporting organizations have not quantified the financing gap for women in the sector. This type of analysis has been very impactful for the financial services sector in helping to identify new areas of market opportunity, define new target customer segments, and examine portfolio quality and use it to target better customers and reduce customer acquisition costs.

"Anecdotal data suggests that only 25 percent of registered PAYGO customers are women, which implies that they face significant barriers to access."

From "Examining PAYGO Solar Through a Gender Lens," CGAP

For example, PAYGO models have been promoted as a way to better reach rural, low-income customers, and as of 2018, 90 percent of solar PV systems are using a lease-to-own PAYGO model.[123] However, as highlighted in CGAP's "Examining PAYGo Solar Through a Gender Lens" exploratory report, PAYGO companies do not currently sex-disaggregate data to determine if and how large the financing gap may be.[124] There is anecdotal evidence that women customers only represent 25 percent of total PAYGO financing, but without the data analysis, it is difficult to make the case to providers that there is a market opportunity.[125]

Perhaps more importantly, though, donors and investors need to support investees in making sex-disaggregated customer and portfolio data more actionable, examining opportunities to utilize them to refine their product offerings. One potential way of doing this is through the gender-action planning process. Since many investees still view gender as outside of their business models, there is an opportunity to financially support activities that allow them to analyze portfolio metrics to make better lending decisions.

6. Financing Initiatives to Support Renewable Energy Firms

As noted earlier in the paper, many renewable energy firms face the ongoing challenge of finding capital to finance their portfolio growth. Compounded by portfolio challenges due to the COVID-19 pandemic, it is often challenging for firms to allocate scarce resources for badly needed investments to their customers and data analytics. This will be of greater importance as the sector expands its focus beyond household goods to PUE assets, since enterprise clients of different genders, shapes, and sizes will have different needs, behaviors, etc. Donors, support organizations, and industry associations should finance initiatives that support companies to build the business case for financing WMSMEs, focusing on four main priority areas:

123 Sotiriou, A.G., et al. "Strange Beasts: Making Sense of PAYGo Solar Business Models," Forum 14, Consultative Group to Assist the Poor, Washington, DC, 2018. www.cgap.org/sites/default/files/Forum-Strange-Beasts-Jan-2018.pdf.
124 Kumaraswamy, op. cit
125 Ibid.

- Developing customer segmentation strategies to define targeted customer groups.
- Conducting customer research to better understand both existing and potential customers, as well as their needs, challenges, and behaviors. This is especially important for existing and potential female customer segments.
- Analyzing portfolios by specific customer segments, defined by the company based on its own sales strategy.
- Refining current offerings based on the analyses.

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Annex 1: Summary of Stakeholders Interviewed

Stakeholder	Summary of Stakeholders Interviewed	Contacts
Investors and fund managers	Alitheia IDF	• Temilade Denton, ESG and Social Impact Manager
	Acumen	• Mercedes de la Vega, Energy Partnerships Senior Associate • Sam Jewett, ESG Strategy
	SIMA Angaza Distributor Finance Fund	• Ida Mwangi • Zain Saleem • Michael Rauenhorst • Michael Murray
	Wangara Green Ventures	• Yvonne Ofosu-Appiah
Financial services providers	Bidhaa Sasa (TBC)	• Rocío Pérez Ochoa, Director and Co-Founder • David Disch, Director and Co-Founder
	Agricultural Development Bank Limited	• Dr. Babu Kaji Thapa, Deputy General Manager/Deputy CEO
Private sector renewable energy firms	Ecotech Mali	• Olivier Starkenmann, Co-Head of Unit at Antenna Foundation/ Co-Founder of Ecotech Mali
	Black Star Energy/Energicity	• Nicole Poindexter, CEO • Iris Chen, Impact Study Advisor
	Freetown Waste Transformers	• Aminata Dumbuya, Founder
	Lanforce Energy	• Judith Marera, Co-Founder
Business support organizations	GOGLA	• Oliver Reynolds, Market Insights and Data Manager • Drew Corbyn, Head of Performance and Investment • David Njugi, East Africa Regional Representative • Rebecca Rhodes, Senior Project Manager, Consumer Protection and Technology
	Center for Rural Technology Nepal	• Dr. Purushottam Shrestha, Executive Director • Ashma Pakhrin
	CIDR/PAMIGA	• Umberto Trivella, Programme Manager, Energy Finance

Stakeholder	Summary of Stakeholders Interviewed	Contacts
International/local development organizations	Energy 4 Impact	• Mathieu Dalle, E4I Regional Director, West Africa • Abdoul Karim Dosso, Senegal Country Director • Abdoulaye Dieng, Director, Access to Finance
	Practical Action East Africa	• Millicent Okello • Jonathan Waita • Lydia Muchiri
	Clean Cooking Alliance	• Lindsay Umalla, Senior Portfolio Manager
Donors and policymakers	USAID Feed the Future Innovation Lab for Small Scale Irrigation	• Dr. Nicole Lefore, Director
	USAID POWER AFRICA Off-Grid Project	• Karen Stefiszyn, Gender Advisor
	Africa Development Bank Affirmative Finance Action for Women in Africa (AFAWA Initiative)	• Esther Dassanou, AFAWA Coordinator
Thought leaders		• Amanda Elam, Center for Women's Entrepreneurial Leadership (CWEL) at Babson College
		• Laura Sundblad, former Access to Finance Specialist, POWER Africa
Women MSMEs	Black Star Energy/Energicity (mentioned above)	Details of certain WMSMEs used in WMSME personas have been anonymized.
	Freetown Waste Transformers (Mentioned above)	
	Female clients of Lanforce Energy	
	Energy 4 Impact Foyré Rewbé 2 Project entrepreneurs	

Annex 2: Template Interview Questions

Questions for KII Interview for DFI, FSP, Investment Funds, INGO, Private Sector Companies, Thought Leaders, and WMSMEs

DFI Questions

Questions for Implementers/Interventions	
Gender Focus	
1. Does your DFI currently have any programs or support any financial institutions focused on improving provision of financial services for women-owned or -led micro and small enterprises? If yes, please describe the following: a. Type of program – savings, loan, asset financing, working capital, etc. b. How does it support financing for women? c. Which financial institutions? d. Criteria for selecting institutions e. Rationale behind program f. Targeted customer segments - size of enterprise, investment amount, value chain, definition of women-led? g. Which key performance metrics do you use to evaluate program performance? • % Increase in female enterprise clients • Outstanding PAR amount • Interest income • % non-performing loan • Deposit volumes • Inactive/active customer rates • Customer retention • Avg # of products per customer • Fees collected • Customer satisfaction rates • Enterprise growth • Others – please describe	
2. Results to date from program Please provide date range	a. Total # of women
	b. % Increase in women clients
	c. % of outstanding PAR of women clients as % of total PAR

	d. Non-performing loans
	e. Other
3. What, if any, changes did your FI partners need to make to better serve women enterprise clients? • **Internally** - Staff training, sex-disaggregated data analysis, credit application processes, etc. • **Externally** - Changes to product features, add in non-financial services, product marketing	
4. How did they fund these changes?	
5. Does your DFI provide any technical assistance to the FIs in the program? If yes, please describe	
6. If yes, which forms of technical assistance have been the most useful for the FIs you work with?	
7. If yes, do you require costs sharing for the technical advisory?	
Renewable Energy Focus	
8. Do any of your FI partners currently have any programs or support any lending focused on the renewable energy sector? If yes, please describe the following: a. Type of program b. How does it support financing in the renewable energy sector? c. Which financial institutions? d. Criteria for selecting institutions e. Rationale behind program f. Targeted customer segments - size of enterprise, investment amount, value chain actor? g. Which key performance metrics do you use to evaluate program performance? h. Do you disaggregate performance by male/female clients?	

9. Results to date from program Please indicate timeframe Only ask for data relevant to their type of program	a. Total # of women b. % increase in women clients c. % of outstanding PAR of women clients as % of total PAR d. Non-performing loans e. Other f. Total # of women
10. What, if any, changes did your FI partners need to make to better serve renewable energy value chain actors? • **Internally** - Staff training, sex-disaggregated data analysis, credit application processes, etc. • **Externally** - Changes to product features, add in non-financial services, product marketing	
11. How did they fund these changes?	
12. Does your DFI provide any technical assistance to the FIs in the program? If yes, please describe	
13. If yes, which forms of technical assistance have been the most useful for the FIs you work with in serving this sector?	
14. If yes, do they require costs sharing for the technical advisory?	
15. As part of the program, do your partner financial institutions offer additional non-financial services to their renewable energy businesses? To their women enterprise customers? If so, please describe.	
16. Are these subsidized through a grant? Or part of the FIs business model?	
Guarantee Programs	
If they are administering a guarantee program:	
Based on the experience of the guarantee program to date, have there been any noticeable shifts in FI perceptions of the bankability of women enterprise clients or renewable energy value chain actors?	
Demand Side	
17. What is the biggest challenge for the financial services providers that you work with in participating in the program?	

18. For those that are the most successful in your portfolio, what do you think is the main contributor to their success? • Commitment of leadership • Product development • Research • Other	
Ecosystem	
19. How competitive are the financial services markets that your partners work in? Very competitive, somewhat competitive, or uncompetitive?	
20. Are there challenging regulatory or external factors that make financial services difficult in the country(ies) where your financial services partners operate?	

Financial Services Providers Questions

Gender Focus		
1. What percent of your current portfolio do women make up?	By # of customers	By PAR Outstanding ($)
	%	%
2. Do you target women with your products and services? Yes/ No If no, proceed to Q9.	Yes	No
3. Please describe the products and services you offer targeting women, (Ask them to describe the characteristics of the product /service)		
4. What was the reason for targeting women as customers? a. Compelling business case? b. Part of institutional growth strategy / business plan? c. Investor pressure? d. Outside financing such as credit guarantee? e. Competitive marketplace? f. Data analytics and research? g. National initiative/requirement?		
5. If interviewee mentioned compelling business case above, What were the most salient factors in determining a strong business case? (profitability, cross-selling loyalty, etc.)		
6. What, if any, changes did you have to make to serve women as clients? • **Internally** - Staff training, sex-disaggregated data analysis, credit application processes, etc. • **Externally -** Changes to product features, add in non-financial services, product marketing		
7. How did you fund these changes? (grants, own profits, included in cost of products)		

8. Which metrics do you track to evaluate product performance? • Outstanding Portfolio at Risk (PAR) amount • Interest income • # of customers • % Non-performing loan • Deposit volumes • Inactive/active customer rates • Customer retention • Avg # of products per customer • Fees collected • Customer satisfaction rates		
9. If they don't have products for women but do have women in the portfolio:		
a. Do you know which of your products are being used by women?		
b. Do you feel the need to do anything different to serve women as clients?		
Renewable Energy Focus		
10. Does your financial institution have financial products specifically targeted to the renewable energy sector?	Yes	No
a. If yes, can you provide us with product term sheets describing products, targeted customer segments, terms and requirements?		
11. How do these products differ from the bank's other offerings? (duration, size/amount, interest rate, etc.)		
12. How do you measure product performance for these products? • Outstanding Portfolio at Risk (PAR) amount • Interest income • # of customers • % Non-performing loan • Deposit volumes • Inactive/active customer rates • Customer retention • Avg # of products per customer • Fees collected • Customer satisfaction rates		

13. Could you provide a breakdown of the % renewable energy products as % of total portfolio?	By # of customers	By PAR Outstanding ($)
14. Does your institution offer any non-financial services to these clients? If Yes, please describe.	Yes	No
15. What was the rationale behind adding them to financial services offerings?		
16. How are these NFS services funded?		
17. How do you track the impact of the NFS?		
18. If more than 50% of the renewable energy product customers are women, proceed to questions a-d below). If not, proceed to Q19.		
a. In your opinion, what are the key financing needs of women-led enterprises that you are serving with the program? How do they differ from male customers?		
b Why do you think women are especially interested in this product or your institution?		
c. If offering NFS, which are most utilized by women enterprises?		
d. Have there been challenges in the uptake by women customers? If yes, why?		
19. If less than 50% of renewable energy product customers are women, proceed to questions a-b below.		
a. Why are women not using it at the same rate as men?		
b. If offering NFS, which are most utilized by women enterprises?		
Ecosystem		
20. How competitive is the financial services market that you work in? Very competitive, somewhat competitive, or uncompetitive?		
21. Are there challenging regulatory or external factors that make financial services difficult in the country(ies) you operate?		

22. Agree or Disagree: Our institution/company prefers to be a first mover when it comes to business adaptations.	
Guarantee Programs	
23. If they are participating in a guarantee program to bolster female participation, answer a – d below:	
a. What was the rationale for participation?	
b. Total Women Clients (timeframe?)	
c. Have there been any challenges in implementation? If Yes, please describe	
d. Based on your experience so far, do you see women clients as a profitable segment that you will continue to target even if there is no guarantee fund?	

Investment Fund Questions

Gender Focus	
1. Are women a priority for your fund?	
2. If so, which target customer segments do you/your investments/ initiatives focus on?	
3. What is your funding strategy? a. Directly invest in women-led / women owned or majority women enterprises b. Invest in FI's or Private Sector companies that fund women-led / women owned or majority women enterprises If a then go to 4 and if b then go to 7	
4. If your fund currently prioritizes funding women-led / women owned or majority women enterprises, please describe the following: a. Criteria for investment b. Targeted customer segments -size of enterprise, stage of growth, investment amount, value chain, definition of women led/ women owned / majority women? c. Which key performance metrics do you use to evaluate investment performance?	
5. Any capacity building or support services provided in addition to investment? If yes, please describe and who provides it? And why did you decide to include this as part of your support package?	
6. Results to date for portfolio (do they have breakdown by investees that they can share?) (Please provide date range)	
a. Total # of enterprises invested in b. Financial services availed - # of enterprises receiving finance? Amount? Type? If possible, with sex disaggregated breakdown c. PAR 30/60/90 depending upon how they track it d. If they are providing non-investment support, what are the impact indicators you track? e. Any other metrics you are tracking across portfolio for investees?	

7. Do you invest in any financial institutions or Private sector companies focused on improving provision of financial services for women-owned or led micro and small enterprises? If yes, please describe the following: a. Type of program – savings, loan, asset financing, working capital etc. b. How does it support financing for women? c. Which financial institutions? d. Criteria for selecting institutions e. Rationale behind program f. Targeted customer segments -size of enterprise, investment amount, value chain, definition of women led? g. Which key performance metrics do you use to evaluate program performance? • % increase in female enterprise clients • Outstanding par amount • Interest income • % Non-performing loan • Deposit volumes • Inactive/active customer rates • Customer retention • Avg # of products per customer • Fees collected • Customer satisfaction rates • Enterprise growth • Others – please describe	
8. Results to date from program Please provide date range	a. Total # of women b. % increase in women clients c. % of outstanding PAR of women clients as % of total PAR d. Non-performing loans e. Other
9. What, if any, changes did your Investee need to make to better serve women enterprise clients? • **Internally -** Staff training, sex-disaggregated data analysis, credit application processes, etc. • **Externally -** changes to product features, add in non-financial services, product marketing	
10. How did your investee fund these changes?	
11. Does your fund provide any technical assistance to the investees to become more gender responsive? If yes, please describe	

12. If yes, which forms of technical assistance have been the most useful for investees?	
I3. If yes, do they require costs sharing for the technical advisory?	
Renewable Energy Focus	
14. Do you invest in any programs or investees focused on renewable energy sector? If yes, describe the following: • Type of program/ investee • How does it support financing in the renewable energy sector? • Which financial institutions? • Criteria for selecting institutions • Rationale behind program • Targeted customer segments -size of enterprise, investment amount, value chain actor? • Which key performance metrics do you use to evaluate program performance? • Do you disaggregate performance by male/female clients?	
15. Results to date from program Please indicate timeframe Only ask for data relevant to their type of program	a. Total Clients with timeframe b. % women clients if available c. Breakdown of types of loans d. % Non-performing loans e. Avg loan size f. Avg savings balance g. Loan Purposes h. Other
16. What, if any, changes did your investee partners need to make to better serve renewable energy value chain actors? • **Internally** - Staff training, sex-disaggregated data analysis, credit application processes, etc. • **Externally** - changes to product features , add in non-financial services, product marketing	
17. How did they fund these changes?	
18. Does your fund provide any technical assistance to the investees? If yes, please describe	

19. If yes, which forms of technical assistance have been the most useful for the investees you work with in serving this sector?	
20. If yes, do they require costs sharing for the technical advisory?	
21. As part of the program, do your investees offer additional non-financial services to their renewable energy businesses? To their women enterprise customers? If so, please describe.	
22. Are these subsidized? Or part of the investees business model?	
Impact	
23. What is the biggest challenge for your investees to better serve women enterprise clients?	
24. For those that are the most successful in your portfolio, what do you think is the main contributor to their success? • Commitment of leadership • Product development • Research • Non-financial services bundle offered • Regulatory environment • Other	
Ecosystem	
25. How competitive are the financial services markets that your partners work in? Very competitive, somewhat competitive, or uncompetitive?	
26. Are there challenging regulatory or external factors that make financial services difficult in the country(ies) your financial service partners operate?	

INGOs Questions

Gender Focus		
For INGOs focused only on women enterprises/entrepreneurs:		
1. Please describe how your program targets women led enterprises or entrepreneurs.		
2. Can you describe the customer segments that your program(s) are targeting? Size of enterprises? Sector? Turnover?		
3. How do you select them?		
4. What are the key financing needs of the WMSMEs you're your program targets? Indicate types of products, risks etc.		
5. How do they differ from male customers?		
6. Does your program help to facilitate access to finance for WMSMEs? If so, how? a. Partnering with financial institutions b. Partnering with private sector companies offering supply chain financing c. Both a and b d. Offering grants or financing themselves e. Other – please describe f. No If a, b or c, proceed to Q7. If d, e or f, try to wrap up interview.		
7. If working with financing partner (FI or supply chain actor), what role do you play in supporting WMSME's access to financial products?		
8. How did you select the financing partner?		
9. What type(s) of financing are being offered to the WMSMEs you work with? Please describe terms if we do not already know.		
10. Is the financing partner receiving any funding to participate in the program? If Yes, please describe.	Yes	No
11. Can you provide program results to date for: a. # of women enterprises/entrepreneurs receiving financing b. Breakdown by type or size c. Amount of financing availed d. Type of financing received e. Purpose of financing f. Sector of business		
12. Is the financing model, profitable for the financial institution? If not, why not?		
13. Do you or your financing partners provide non-financial services to WMSMEs/entrepreneurs? If yes, please describe. How are they funded?	Yes	No
14. What is the biggest challenge in working with the financial service provider partner in the program?		

15. What is the biggest challenge for the financial service providers that you work with in participating in the program?	
16. Only if working with multiple financing partners: For those financing partners that have been the most successful in serving women in your portfolio, what do you think is the main contributor to their success? • competitiveness of market, • ecosystem • non-financial services offered? • Commitment of management? • Other?	
For INGOs focused only on renewable energy:	
17. Please describe how your program works in the renewable energy sector. Do you have any specific gender focus? If so, please describe.	
18. Please describe the renewable energy enterprises or entrepreneur customer segments that your program(s) are targeting. Do you disaggregate by gender? Size of enterprises? Sector? Turnover?	
19. How do you identify them?	
20. What are the key financing needs of these renewable energy enterprises/ entrepreneurs that your program targets? Indicate types of products, risks etc.	
21. Ask only if they sex disaggregate: Are there differences in financing needs between female and male customer segments? Why or why not?	
22. Does your program help to facilitate access to finance for RE enterprises/entrepreneurs? If so, how? a. Partnering with financial institutions b. Partnering with private sector companies offering supply chain financing c. Both a and b d. Offering grants or financing themselves e. Other – please describe f. No If a, b or c, proceed to Q22 If d, e or f, try to wrap up interview.	
23. If working with financing partner (FI or supply chain actor), what role do you play in supporting RE enterprise/entrepreneur access to finance?	
24. How did you select the financing partner?	

25. What type(s) of financing are being offered to the RE enterprises you work with? Please describe terms if we do not already know.		
26. Is the financing partner receiving any funding to participate in the program? If Yes, please describe	Yes	No
27. Can you provide program results to date for: a. # of RE enterprises/entrepreneurs receiving financing b. Breakdown by type or size c. Breakdown by sex of business owner/leader of entrepreneur d. Amount of financing availed e. Type of financing received f. Purpose of financing g. Type of business/value chain role?		
28. What is the biggest challenge in working with the financial service provider partner in the program?		
29. What is the biggest challenge for the financial service providers that you work with in participating in the program?		
30. Only if working with multiple financing partners: For those financing partners that have been the most successful in serving RE enterprises/ entrepreneurs in your portfolio, what do you think is the main contributor to their success? • competitiveness of market, • ecosystem • non-financial services offered? • Commitment of management? • Other?		
31. Only if working with multiple financing partners: Have any of these entities had particular success with women owned or led businesses? If yes, why?		
Ecosystem (Ask only if they have a financing partner)		
32. Are there any particular regulatory challenges to providing financing in the market where you work? If yes, please describe.		

Private Sector Company Questions

Questions for Implementers/ Interventions			
General			
1. What types of products do you sell?			
2. Do you have a breakdown of your end customers by gender? Type of enterprise?	Female: Type of Enterprise:		
3. How does your company sell and distribute its products? • Sales agent model • Company owned distribution and sales locations • Franchisee model • Partnerships • Independent retail/distribution partners • Other			
4. How do you recruit new supply chain partners? Do you utilize any strategies to increase female enterprise or entrepreneur participation? If yes, please describe.			
5. If they are using sales agents, franchisees, or distribution partners, do they have a breakdown of the number of women-owned/led businesses they work with?			
	Sales Agents	Franchisees	Distribution Partners
Male led			
Female led			
6. How do your clients finance their purchase? a. Company provides bundled financing options b. We partner with Financial Service providers c. Clients provide their own financing If a then go to 7, if b then go to 15 and if C then go to 16			

7. If you provide financing along with the product, please provide details on: a. # of clients (Do they disaggregate by sex?) b. Type of enterprise served - distributor? sales agents? Please describe. c. If providing asset financing, which products financed d. Size of business (Micro, small, medium) e. If loans: Outstanding Par Amount or avg loan size f. If loans, Non-performing loan % g. Type of financing provided– working capital, equipment loan, concession, etc. h. Products, terms -length, amounts, repayments i. Requirements/Screening criteria to qualify	Customer finance	Supply chain finance
8. Does your company employ any strategies for increasing women's participation in your supply chain? For its customer base? Please describe.		
9. Do you track any metrics related to financing? If so, which ones?		
10. Does the company have information about uptake of financing for women enterprises in their for supply chain partners? For female end customers?	% Female supply chain partners receiving finance % female customers receiving finance	
11. Why did the company decide to offer its own financing?		
12. How did the company design the financing? Did it make any modifications based on the specific constraints of women?		
13. As part of your credit application process, do you perform a risk analysis for partners? For customers? If so, what do you look at? Is this more challenging for your female led business partners?		
14. Have there been challenges in delivering financing? If yes, please describe		
15. If company is providing access to finance through linkage or partnership with financial institution:		

a. How did they identify the partner(s)?	
b. Which partners do they work with?	
c. Do the partner institutions offer specialized products or services *for women entrepreneurs?	
d. How does it work? Do they provide specific information or vet potential bank customers?	
16. If company does not provide financing for renewable energy value chain actors, answer questions a-b.	
How do distributors/retailers typically finance inventories? Please describe.	
Does this present a challenge for working with female enterprises in the supply chain? Please explain.	
Non-financial services	
17. Does the company offer any non-financial services to agents or distributors? To customers? If yes, please describe.	
18. How are these funded?	
19. If Yes to Q17, are there any lessons learned about how these non-financial services contribute to business performance/ longevity? For female customers? If Yes, why?	

Thought Leadership Questions

Gender Focus	
1. Can you provide a brief overview of how your work relates to women's small or micro enterprises?	
2. Can you describe the specific WMSME customer segments that your work or research focuses on? How do you define them?	
3. In your opinion, what are the key financing needs of these women owned or led enterprises? Types of products, risks etc. How do they differ from male customers?	
4. Are you aware of any particular financing models/entities that are successfully addressing these needs? Please describe. Make sure to note names of entities with follow up ask for contact information	
5. For those models/entities that are the most successful in serving women (or in the renewable energy sector) in your portfolio, what do you think is the main contributor to their success? Are there any trends in successful FIs – competitiveness of market, ecosystem, non-financial services offered? Commitment of management?	
6. How have they overcome challenges in serving WMSMEs? Are there particular trends in the markets where they operate or the types of WMSMEs they serve?	
7. What do you think is the biggest challenge for the financial service providers in serving WMSMEs?	
8. Do you have any recommendations for a potential case study that we could include about an FI adapting its processes to better serve women MSMEs?	

WMSE Questions

<table>
<tr><th colspan="7">Questions for Implementers/Interventions</th></tr>
<tr><td colspan="7">General – The first set of questions are designed for us to get more information about you and your company. We intend to create a profile of several different types of women entrepreneurs. Consequently, some of the questions will gather information about you and others will be related to the company.

We are planning to interview a wide variety of different female entrepreneurs and enterprise sizes, so some of our questions may not be as appropriate for you. But it is important for us to establish a baseline, so we appreciate your understanding in answering them.

Any information shared here will be anonymized to protect your identity and the company's identify.</td></tr>
<tr><td rowspan="2">1. Marital Status</td><td colspan="2">Single</td><td>Married</td><td>Divorced</td><td colspan="2">Widowed</td></tr>
<tr><td colspan="2"></td><td></td><td></td><td colspan="2"></td></tr>
<tr><td rowspan="2">2. Including yourself, how many people currently live in your household?</td><td>I live alone</td><td>2-3</td><td>4-6</td><td>7-9</td><td colspan="2">10+</td></tr>
<tr><td></td><td></td><td></td><td></td><td colspan="2"></td></tr>
<tr><td rowspan="2">3. What is the highest level of education you have achieved (also may be found on website)</td><td>Primary</td><td>Secondary</td><td>University</td><td colspan="3">Graduate Degree</td></tr>
<tr><td></td><td></td><td></td><td></td><td colspan="2"></td></tr>
<tr><td rowspan="6">4. Please indicate which of the following business documents you possess. (This question maybe more applicable to smaller businesses)</td><td colspan="6">National ID</td></tr>
<tr><td colspan="6">Business permit / registration certificate</td></tr>
<tr><td colspan="6">Business records for at least 6 months</td></tr>
<tr><td colspan="6">Business operations for at least 12 months</td></tr>
<tr><td colspan="6">Loan securities (logbook, title deed, household goods, business assets)</td></tr>
<tr><td colspan="6">Bank statements for at least 6 months</td></tr>
<tr><td rowspan="2">5. How would you classify your business' ownership? (may be found on website)</td><td colspan="2">Women Owned</td><td colspan="4">Jointly Owned</td></tr>
<tr><td colspan="2"></td><td colspan="4"></td></tr>
<tr><td>6. How many years have you been an entrepreneur? In your current company?</td><td colspan="6"></td></tr>
<tr><td>7. Is this your first owned business?</td><td colspan="6">Yes or No</td></tr>
</table>

8. Type of company -social enterprise, for profit, non-profit	For profit		Social enterprise	Non profit	Other
9. Sector of business	Renewable energy		PUE		Other
10. Please tell us all of the statements with which you agree or identify	• I've always wanted to start my own business.				
	• I started this business because it's so difficult to find a good job otherwise.				
	• Family or friends were already doing this kind of business before me.				
	• I do this work to supplement the main income source in my household				
11. Size of Company (# of employees)	1-4	5-10	11-15	16-20	20+
12. How would you describe your company's business stage? (a) startup - less than one year (b) normal ops - 1-3 years (c) growth - 3-5 years (d) stagnant or slow growth >5 years	a) Startup		b) Normal operations	c) Growth	d) Contraction
13. Aspirations of business – please tell us the which of these statements you agree with most.	• If my business continues much as it is right now, I will be satisfied.				
	• My goal is to work hard so that my business continues to grow.				
	• I'm only doing this business until I find a better job working for someone else.				
	• I've been looking for a way out of this business so that I can do something else.				
14. Does your business provide your household's primary source of income?	Yes or No				

<table>
<tr><td rowspan="4">15. Risk: Please choose all of the statements with which you agree or identify:</td><td colspan="5">• If I unexpectedly received a large sum of money, I would invest all of it directly into my business.</td></tr>
<tr><td colspan="5">• If I received a large sum of money, I would save all of it in case I needed it later.</td></tr>
<tr><td colspan="5">• If I received a large sum of money, I would mostly spend it on personal and household things.</td></tr>
<tr><td colspan="5">• If I received a large sum of money, I would invest half in my business, and the other half on other things.</td></tr>
<tr><td rowspan="4">16. Resilience: Please choose all of the statements with which you agree or identify:</td><td colspan="5">• If my business grows larger, it would be too much for me to handle.</td></tr>
<tr><td colspan="5">• I feel like I have access to the tools, information, and support I need to overcome the challenges before me.</td></tr>
<tr><td colspan="5">• I feel most business and financial services are not intended to serve problems my business faces.</td></tr>
<tr><td colspan="5">• I often worry that my business won’t survive another year</td></tr>
<tr><th colspan="6">Business Performance and Digitization</th></tr>
<tr><td rowspan="2">17. Gross Annual revenues (not sure about which buckets to use)
• Pre-COVID
• Last year (since COVID)</td><td>< $25K</td><td>$25K+ – 50K</td><td>$50K+ - 100K</td><td>$100K+ - 300K</td><td>Over $300K</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">18. Annual net profit (not sure about which buckets to use)
• Pre-COVID
• Last year (since COVID)</td><td>< $10K</td><td>$10K+ – 25K</td><td>$25K+ - 75K</td><td>$75K+ - 100K</td><td>Over $100K</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="5">19. Does your monthly business revenue fluctuate significantly, either throughout the year or by season?</td><td colspan="5">• Never</td></tr>
<tr><td colspan="5">• Rarely</td></tr>
<tr><td colspan="5">• Sometimes</td></tr>
<tr><td colspan="5">• Often</td></tr>
<tr><td colspan="5">• Always</td></tr>
<tr><td>20. Please describe your main customers. Are they women? Are they enterprises?</td><td colspan="5">% breakdown</td></tr>
</table>

21. Sex disaggregated breakdown of sales by payment type - cash, PAYGO, credit, other?	% breakdown
22. Does your business record sales using manual or digitized processes?	
23. If using PAYGO, how does your business keep track of customer repayments over time? Are there any challenges to that?	
24. If providing financing to clients, how do you keep track of repayments? Are there any challenges to that?	
Access to Finance	
25. Account ownership - Indicate all that apply	• I have a personal savings account at a financial institution
	• I have a business savings or current account at a financial institution
	• I am a member of a VSLA/ROSCA/savings group
26. How did you fund the startup of this business? Were there any challenges?	
27. Which of these financial services have you used for your business? (choose all that apply)	• Mobile wallets
	• QR payment codes
	• Bank transfers
	• Savings accounts
	• Retirement savings/investment accounts
	• Checking/Current accounts
	• E-factoring services
	• Insurance
	• ROSCAs
	• Cash in/Cash out agents

28. Do you have any assets that have been used for, or held in the name of, your business? If yes, which ones? • I have no business assets • Land/property • Vehicle (car/truck/ motorbike) • Machinery/ equipment • Kiosk/market stall • Inventory or livestock • Trademarks • Personal guarantees (a person who will guarantee a loan or secure access to valuable services for you) • Other possessions (such as jewelry, gold, electronics, appliances, computers, etc.)					
29. Prior to working with GET.invest (if appliable), how did you typically finance your business? For what purpose? Why did you choose this method? • From profits • Using credit (from a financial institution) • Finding equity partners • Borrowing from friends and family • Other sources of income • Other (please describe)					

30. If Yes to credit at a FSP, what types of information/ documentation did you have to provide? Any collaterals?	
31. If Yes to credit, how often did you borrow to help finance/run your business?	• I've never borrowed or received money for my business
	• Less than once per year
	• Once per year
	• 2-3 times per year
	• 4 or more times per year
32. If Yes to credit, what did you use the loan(s) for?	
33. If Yes to credit, have there been any challenges or headaches associated with securing it? Please describe - during which parts of the process?	
34. If no to credit, why not?	
35. If using profits to pay for business needs, why?	
36. What do you think is the hardest thing for women like you in working with financial institutions or partners?	
37. How did you decide where to seek financing?	

38. If you are working with GET.invest, did you receive any business development support? Please describe.			
39. If Yes to Q28, which type of business development support was most impactful to you? How did you find out or learn about it?			
Information Networks			
40. Where do you normally get information/advice about finances? business? Personal issues? (check those that apply) OR we could ask it this way: Where do you think women entrepreneurs, like yourself, seek business advice? Personal advice> finances?	Finances	Business	Personal
• Internet – website			
• Facebook or Social media			
• Husband			
• Friend or other Family member			
• Fellow Entrepreneur			
• Church member			
• Savings group member			
• Other – please describe			

<table>
<tr><td>41. What social platforms have you used for your business? (indicate all that apply)
WhatsApp
Facebook
Instagram
Messenger
Other (specify)</td><td colspan="5"></td></tr>
<tr><th colspan="6">Business model questions (if there is additional time)</th></tr>
<tr><td>42. How does your company sell and distribute its products?
Sales agent model
Company owned distribution and sales locations
Franchisee model
Partnerships
Independent retail/ distribution partners
Other</td><td colspan="5"></td></tr>
<tr><td colspan="6">43. If they are using sales agents, franchisees, or distribution partners, do they have a breakdown of the number of women-owned/led businesses they work with?</td></tr>
<tr><td></td><td colspan="2">Sales Agents</td><td>Franchisees</td><td colspan="2">Distribution Partners</td></tr>
<tr><td>Male led</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Female led</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>44. Does your company employ any strategies for increasing women’s participation in your supply chain? For its customer base? Please describe.</td><td colspan="5"></td></tr>
<tr><td>45. If providing PAYGO services, how do you qualify customers?</td><td colspan="5"></td></tr>
</table>

46. If providing PAYGO services, do you do any analysis about who is using these services, who is consistently paying? If so, are there any trends by gender? Enterprise client?	
47. Why did the company decide to offer PAYGO/ its own financing?	
48. How did the company design the financing? Did it make any modifications based on the specific constraints of women?	
49. As part of your credit application process, do you perform a risk analysis for supply chain partners? For customers? If so, what do you look at? Is this more challenging for your female led business partners?	
50. If providing supply chain credit, do you track any metrics related to financing? If so, which ones?	
51. Have there been challenges in delivering financing? If yes, please describe	
52. If company is providing access to finance through linkage or partnership with financial institution:	
a. How did they identify the partner(s)?	

b. Which partners do they work with?	
c. Do the partner institutions offer specialized products or services *for women entrepreneurs?	
d. How does it work? Do they provide specific information or vet potential bank customers?	
53. If company does not provide financing for renewable energy value chain actors, answer questions a-b.	
a. How do distributors/ retailers typically finance inventories? Please describe.	
b. Does this present a challenge for working with female enterprises in the supply chain? Please explain.	
Non-financial services	
54. Does the company offer any non-financial services to supply chain partners? To customers? If yes, please describe.	
55. How are these funded?	
56. If Yes to Q54, are there any lessons learned about how these non-financial services contribute to business performance/ longevity? For female customers? If Yes, why?	

ENERGIA is an international network of like-minded organizations and professionals, active in Africa and Asia. Our vision is that women and men have equal and equitable access to and control over sustainable energy services as an essential human right to development. To achieve this, we:

- contribute to energy access for all by scaling up the delivery of energy services through women-led micro and small businesses;
- advocate for and provide technical support to mainstream gender approaches in energy policies and programs;
- provide the evidence base for improving energy investment effectiveness through research;
- raise awareness and enhance knowledge of issues related to gender and energy through networking and knowledge products.

Our efforts are consistent with the global agenda on poverty eradication, universal access to energy and gender equality under the 2030 Agenda for Sustainable Development.

ENERGIA is hosted by Hivos, an international organization that seeks new solutions to persistent global issues. With smart projects in the right places, Hivos opposes discrimination, inequality, abuse of power and the unsustainable use of our planet's resources.

ENERGIA
INTERNATIONAL NETWORK ON
GENDER & SUSTAINABLE ENERGY

Hivos
people unlimited