

# Unlocking Social *and* Environmental Impact



*Outcome-based Finance in Clean Cooking,  
Distributed Renewable Energy,  
and Small-Scale Agribusiness*

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IN PARTNERSHIP WITH



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# About this Brief

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This brief, supported by the Government of Japan and developed by IFC in partnership with Social Finance, is intended for potential outcome buyers, investors, and other partners seeking to drive social and environmental impact by supporting and financing enterprises. It summarizes the findings from research into the priorities of outcome buyers and their potential to support the growth of enterprises in clean cooking, distributed renewable energy, and agribusiness, and reflects the International Finance Corporation's focus on accelerating climate finance, addressing gender inequality, and driving economic inclusion through private sector development in emerging economies.



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# Executive Summary

Global investment capital is lagging well behind levels needed to achieve the United Nations Sustainable Development Goals (SDGs) by 2030. However, **outcome-based finance, a form of impact-linked finance, offers a way to increase funding that provides significant social and climate impact in emerging markets.** Under this model, an 'outcome buyer'—to date, often a foundation, government, or development agency—pays service providers when they achieve pre-agreed, verified social or environmental goals. This can drive investment into small but high impact enterprises in emerging markets and support their growth.

**This research explores factors required to support the use of outcome-based finance, along with the interests and priorities of potential outcome buyers in three sectors: clean cooking, distributed renewable energy, and small-scale agribusiness.** A survey of potential outcome buyers and organizations with knowledge of outcome-based transactions provides insights into their characteristics, motivations, and priorities, along with key informant interviews, secondary literature, and data from MCSI Carbon Markets Intelligence (formerly Trove Research) and AlliedOffsets. The research identifies barriers to building demand for outcome-based finance. Understanding and addressing these barriers could catalyze more outcome-based finance to help developers of clean cooking, distributed renewable energy, and small-scale agribusiness projects diversify their revenue streams, identify new investors, and access additional capital to grow their operations.

## **Part 1: Inside the Voluntary Carbon Market**

**Part 1 of the report focuses on outcome credits traded in the voluntary carbon market and related infrastructure.** These include carbon credits with 'co-benefits' or additional social and environmental outcomes, as well as standalone credits that support SDG outcomes. Two types of buyers are identified: buyers who purchase credits to trade them and 'end buyers' who buy credits to retire them for climate impact. The market is dominated by a few buyers, and brokers play a significant role in mediating transactions. Across the three sectors, clean cooking credits have the most retirements compared to distributed renewable energy and small-scale agriculture.

**The cost of credits in the voluntary carbon market depends on the type of outcome credit and the sector, and these are important factors for buyers.** There is a belief among market actors that having co-benefits, such as social or environmental goals alongside climate goals, should raise credit prices in clean cooking, distributed renewable energy, and small-scale agribusiness. However, data from the voluntary carbon market indicates that only projects with four or more additional SDG outcomes tend to generate higher prices compared to those with only one co-benefit.

**Some buyers are willing to pay more for outcomes linked to the gender equality goals of SDG-5, but only once they are made aware of the potential gender benefits produced by project developers.** MSCI Carbon Markets (formerly Trove Research) found a statistically significant price premium for gender equality SDG credits in the Voluntary Carbon Market, while other individual SDGs did not have a statistically significant impact on price.

**In general, outcome buyers are not motivated by co-benefits created through projects in clean cooking, distributed renewable energy, or small-scale agribusiness.** Survey findings show that neither the presence nor the absence of SDG co-benefits is a major driver for buyers to initiate transactions. Instead, experienced buyers are more motivated by the revenue split or the proportion of revenue from the sale of credits flowing back to project developers and other service providers. There is increasing demand from buyers for more visible and equitable revenue-sharing models, especially since brokers dominate relationships between sellers and buyers in the voluntary carbon market and typically require a significant share of transaction earnings.

**Buyers are also driven by sector and geographic considerations, market trends and standards, and reputational concerns.** Buyers in the voluntary carbon market are generally more interested in purchasing credits in sectors or geographies that align with their operations, for example, in sectors or areas where they have a large customer base or footprint. Emerging standards and best practices on credible pathways to corporate sustainability and net-zero strategies are also driving demand for different types of carbon credits, for example for removal credits rather than avoidance credits. Finally, public scrutiny of the credibility of emissions reductions in the voluntary carbon market and controversy over greenwashing are motivating buyers to pursue higher quality, verified credits produced by trusted project developers.

**While this research focuses on outcome buyers, it also identifies several challenges faced by project developers and service providers.** A key barrier is the high cost of developing carbon projects, especially for smaller enterprises operating in clean cooking, distributed renewable energy, and small-scale agribusiness. This, coupled with a lack of transparency on prices, makes it difficult for businesses to know if projects will be commercially viable. Without clearer price signals in the voluntary carbon market, project developers are hesitant to invest in new technologies or verification processes that could improve the quality of their credits and increase their value and demand from buyers. In addition, new developers often struggle due to a lack of established relationships with buyers.



**Collaborative partnerships between impact investors, including development finance institutions, and corporations could pave the way for new strategies to monetize impacts and drive revenue for small and growing enterprises.** Impact investors, including development finance institutions, could partner with corporates that have relatively low emissions, are committed to social and environmental impact, or that operate in sectors where brand reputation matters. Such collaboration could create a pipeline of projects, and high-impact enterprises could secure better prices for the benefits they deliver. Moreover, the disintermediation of the voluntary carbon market could enable more outcome-based financing to flow directly to service providers.

**In addition, aggregation could play a crucial role in building confidence in carbon credit integrity and enabling small enterprises to monetize their climate and social impacts.** For example, Rabobank's Acorn platform connects small-scale agro-forestry projects with buyers, facilitates credit sales, and directs the majority of carbon revenues back to smallholders. This example and others can serve as models for similar aggregation platforms in the distributed renewable energy and clean cooking sectors.

**Addressing voluntary carbon market failures will require long-term commitment to market development.** Carbon credits are relatively well understood, but buying SDG outcomes is a new concept for many potential buyers. Educating outcome buyers and advocating for projects that are both high impact and high integrity are vital. Technical assistance will be needed to support medium-to-long term investment opportunities, even if this does not yield increased deal flow in the short-term.

## **Part 2: Outside the Voluntary Carbon Market**

**Part 2 of the report looks at buying standalone SDG outcomes independent from carbon outside the voluntary carbon market.** While there are currently no established markets for trading SDG outcomes outside of the voluntary carbon market, progress is being made to set up the necessary building blocks. These building blocks include buyers that are interested in purchasing SDG outcomes; sellers that are capable of creating these outcomes through projects; tools for defining, measuring, and verifying outcomes; and a market structure connecting buyers and sellers. This report only evaluates aspects related to buyers, defining, and verifying outcomes, and the market structure, leaving out the assessment of sellers.

**Potential buyers of SDG outcomes related to clean cooking, distributed renewable energy, and agribusiness include development agencies, philanthropic foundations, and private corporations with social impact missions.** To date, development agencies have been the most active buyers, often through one-off projects. These early deals and pilot projects

are critical for testing potential models that could be replicated and scaled to grow the market for standalone SDG outcomes. Surveys also suggest growing interest from corporations and philanthropies in buying SDG outcomes from the focus sectors, but more effort is required to convert interest into commitment. Building a collection of successful examples, particularly by institutions willing to engage in new transaction types, will be vital for developing and expanding activity in the market.

**Attributing outcomes to the activities undertaken by project developers is crucial in determining whether an outcome buyer will pay for them.** This attribution relies on having clear, widely accepted standards and definitions for SDG outcomes. Unlike carbon credits, which use a ton of CO<sub>2</sub> equivalent as a standard unit, there is no universal measure for SDG outcomes. This means that, to date, transactions have been customized and designed as bespoke projects. These individual deals set important precedents in the market. However, without common units to measure impact for each SDG area or sector, it is unlikely that a broad market for SDG outcomes will develop. Fortunately, there are emerging standards and tools to quantify SDG outcomes, such as W+ credits, which measure women's economic empowerment through various indicators.

**There is potential to create a new market for standalone social and environmental outcomes outside the voluntary carbon market, and this will take time.** Currently, opportunities for outcome-based revenues outside the voluntary carbon market are limited, but it is important to build on work done to date. Strategic partnerships between investors and outcome buyers could help generate high-quality transactions that can serve as a precedent and build broader market demand. In the long term, regulations and shared principles similar to those that govern transactions in the voluntary carbon market are key to developing market structures that facilitate efficient purchasing of SDG outcomes. While governance structures are minimal at present, regulations on the disclosure of social and environmental impacts are likely to increase, which could bring greater credibility and transparency to the SDG-outcomes market and pull in more buyers and sellers.

**Standard definitions and metrics for different outcomes must be established, and capacity to measure, report, and verify outcomes must be strengthened.** An initial focus on a subset of outcomes could grow demand from outcome buyers. For instance, prioritizing the definition and measurement of health or gender outcomes—where there is already some traction, reasonable data, and an operational track record—could kickstart progress and contribute to increasing the necessary global investment capital to achieve the Sustainable Development Goals.



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# I. Introduction

Outcome-based finance is a form of results-based finance, sometimes referred to as pay-for-performance, that has the potential to catalyze the growth of high-impact enterprises that help to meet global Sustainable Development Goals (SDGs).<sup>1</sup> Under an outcome-based model, the 'outcome buyer'—to date, often foundations, governments, or development agencies—pay project developers, businesses, and other service providers upon the achievement of pre-agreed social or environmental outcomes or benefits. Outcomes are quantified, verified, and monetized through their sale to outcome buyers to generate revenue.

**Small, high-impact project developers and other service providers in the clean cooking, distributed renewable energy, and small-scale agribusiness sectors often struggle to attract traditional investors.** Outcome-based mechanisms can forge connections between the two and unlock capital for advancing SDG outcomes. This revenue can also help enterprises that deliver social and environmental benefits to grow and scale, making them more attractive to traditional investors. Furthermore, the nature of outcome-based transactions can improve the effectiveness, efficiency, and accountability of social and environmental interventions, with better outcomes for individuals and communities.

**This study looks at how the use of outcome-based finance can help project developers in clean cooking, distributed renewable energy, and small-scale agribusiness sectors generate revenue streams. It focuses on understanding the needs and motivations of outcomes buyers in these sectors.** This knowledge can help to attract more investment in these key sectors and assist developers and service providers who need funding to achieve environmental and social goals, such as helping underserved populations like women and people living at the base of the economic pyramid.<sup>2</sup> There are two main research objectives:

1. To assess demand from outcome buyers to purchase carbon credits with social and environmental outcomes and for standalone social and environmental outcomes outside the established carbon market.
2. To identify the current challenges and opportunities for outcome buyers to transact in carbon and SDG-outcome markets.

## Understanding Outcome-based Finance and Its Potential Uses

A variety of instruments fall into the category of outcome-based finance. Fundamentally, all require sellers and buyers to trade pre-agreed social or environmental outcomes that are quantified, verified, and, typically, ambitious. The process involves three main players: an outcome buyer, a service provider, and an independent verification agent.

Service providers—such as project developers, enterprises, or small businesses—produce social or environmental benefits through their activities, and then quantify and sell these outcomes to interested buyers. Outcome buyers are governments, corporates, financial institutions, philanthropies, or other impact-focused organizations that are willing to pay for the pre-agreed outcomes of an intervention, service, or project—once these have been achieved and verified—for an agreed price. The verification agent verifies the outcomes, which triggers the disbursement of the funding from buyer to service provider ([GPRBA 2020](#)).

In some cases, service providers are supported by financiers such as commercial banks, investors, philanthropists, or microfinance institutions to deliver the interventions. Other market players can include brokers or intermediaries that connect potential outcome buyers and sellers (see Figure 1).

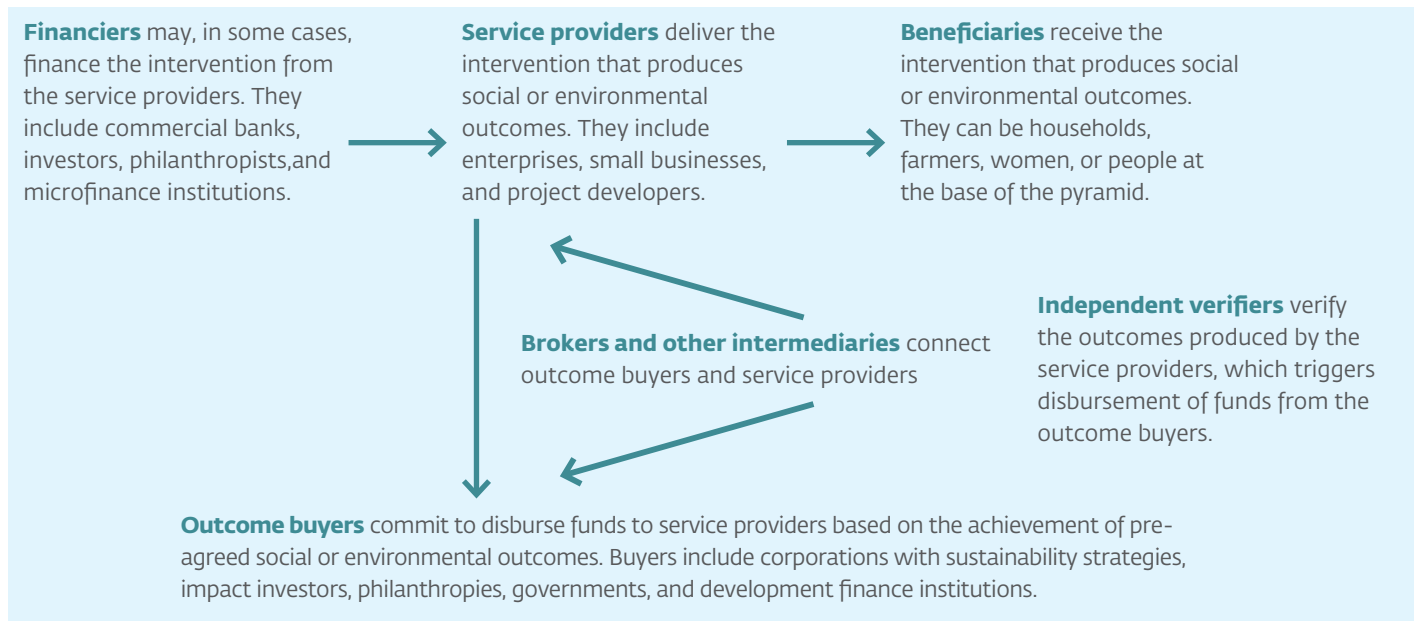


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<sup>1</sup> The SDGs were adopted in 2015 at the United Nations Sustainable Development Summit and set 17 overarching goals to be achieved by 2030, including poverty reduction (SDG 1), zero hunger (SDG 2), gender equality (SDG 5), affordable and clean energy (SDG 7), and climate action (SDG 13), among others.

<sup>2</sup> The base of the pyramid typically refers to individuals who live on \$8.00 a day or less.

**Figure 1: Outcomes Funding Process and Key Market Players**



Source: Adapted from 'An Introduction To Outcome-Based Financing' (GPRBA 2020).

All results-based finance approaches make disbursement of funding contingent on the achievement of verified results, but outcome-based finance ties funding to outcomes, rather than to intermediary results such as activities and outputs. For example, rather than using the number of clean cookstoves sold to households, the trigger for payment for outcome-based finance could be the measured health and gender equality benefits produced from the household use of clean cookstoves.

Outcomes are often linked to the SDGs, but the definition of an outcome varies according to the results service providers can produce and attribute to their activities and what buyers are willing to pay for. This focus on outcomes incentivizes service providers to achieve results that are more closely linked to development objectives, such as reduced poverty and gender equality. This approach also incentivizes service providers to adjust implementation to achieve ambitious outcomes, ultimately resulting in more impact for individuals and communities (GPRBA 2020).

The most well-known and widely used outcome-based market is the carbon market, where carbon credits are bought and sold as part of efforts to reduce global greenhouse gas (GHG) emissions. The outcome in this case is carbon, and one carbon credit equals one ton of carbon dioxide (CO<sub>2</sub>) reduced, sequestered, or avoided—or the equivalent amount of another greenhouse gas (UNDP 2022).

There are two types of carbon markets, the compliance carbon market and the voluntary carbon market. The compliance market is the result of national, regional, or international policies or regulations, while the voluntary carbon market is built on the voluntary issuance of carbon credits. Given that the purpose of the compliance market is to offset carbon liabilities cost-efficiently and at scale, credits in this market are unlikely to be bought for their social or environmental co-benefits, such as gender equality, health, conservation, or other benefits. In the voluntary carbon market demand is driven by corporations, foundations, or individuals that wish to offset or compensate for their carbon footprints by buying carbon credits as part of their sustainability strategies.

Consumer behavior, regulatory interventions, and global events such as the COVID-19 pandemic are increasing the private sector's interest in social impact. However, there are no well-established markets for trading social and environmental outcomes like there are for carbon. This leads to inefficiencies such as a knowledge gaps in what works and what actually delivers results (SSIR 2023). Moreover, it is difficult to measure social impact or progress towards SDGs for every dollar invested. A midpoint review of progress toward the SDGs shows that the annual investment gap in developing countries grew to \$4 trillion in 2023, up from an estimated \$2.5 trillion in 2014 (UNCTAD 2023). To help reduce this gap, businesses and investors must be able to assess social and environmental

outcomes and adequately price them. This makes understanding and developing market mechanisms through which investors can purchase high-quality, verified SDG outcomes more vital than ever.

## Financing Clean Cooking, Distributed Renewable Energy, and Small-Scale Agribusiness

**This report examines how outcome-based finance can support clean cooking, distributed renewable energy, and small-scale agribusiness. These sectors were chosen because they include many small businesses that often struggle to get funding, even though they can make a significant impact on underserved communities and people at the bottom of the economic pyramid.** While a number of agribusiness and distributed renewable energy businesses already deliver scale and exhibit the financial position and risk profile that attract investments from development finance institutions and commercial investors, this is not the case for smaller enterprises. For example, most businesses in the clean cooking sector have failed to reach sales volumes that enable them to build their businesses or scale operations, and risk aversion has driven investors towards familiar investees rather than new ventures (ESMAP 2020).<sup>3</sup> The following sections provide more information on the sectors, their SDG co-benefits, and investment needs and challenges.

### Clean Cooking

**Clean cooking refers to the transition from cooking with traditional stoves heated by wood, animal dung, coal, or other polluting fuels to cookstoves powered by cleaner, more energy-efficient fuels.** An estimated 2.3 billion people lack access to clean cooking facilities (IEA 2023). Affordable and accessible clean cooking services are associated with a range of SDG outcomes, including health, climate, environment, and gender equality (Clean Cooking Alliance 2022). For example, transitioning households to cleaner fuels and cookstoves reduces household air pollution that is linked to approximately four million premature deaths annually (ESMAP 2020). Clean cooking also contributes to climate goals by decreasing greenhouse gas and black carbon emissions from wood and charcoal use. Transitioning to modern cooking facilities also reduces forest degradation and local deforestation driven by the use of biomass fuels. Because women and girls are typically responsible for household cooking activities—including sourcing fuel and cooking food—access to modern cooking facilities can also improve gender outcomes by reducing time poverty for women and contributing to better health outcomes for them.

Achieving universal access to clean cooking by 2030 will require substantial investments, with estimates ranging from \$7 billion annually to achieve clean cooking targets under SDG-7 to as high as \$158 billion per year to support a full transition to modern energy cooking services by 2030 (IEA 2023, ESMAP 2020). Financing for clean cooking enterprises grew to an all-time high of \$215 million in 2022, but this remains far off track to reach over two billion people who still cook with traditional cookstoves and fuels (Clean Cooking Alliance 2023). Clean cooking projects are still perceived as high-risk for investors, making outcome-based finance an important area for exploration.

### Distributed Renewable Energy

**Distributed renewable energy refers to an electricity generation system that incorporates multiple small-scale devices rather than a centralized power plant and distribution network and includes solutions such as solar-powered off-grid and mini-grid systems.** An estimated 775 million people around the world live without electricity (IEA 2022). Distributed renewable energy can help communities transition from carbon-intensive generators to cleaner energy sources without requiring large-scale infrastructure investments in the grid. Improved energy access has been linked to human capital development, environmental and climate outcomes, and economic outcomes (IRENA 2019). For example, distributed renewable energy can reduce pollution, provide low-carbon energy alternatives, and increase climate resilience. In off-grid areas, it provides energy needed to protect vaccines from spoilage, powers streetlights that improve safety for women and girls at night, and enables household lighting for students to study in the evenings thereby promoting human capital development.

To meet rising energy needs while aligning with the Paris Agreement, annual investment from public and private sources would need to reach \$2.2–2.8 trillion per year by the early 2030s in emerging markets and developing economies (IEA 2023). At present, just \$770 billion is invested in clean energy, and most of this is driven by investments in China, India, and Brazil.<sup>4</sup> Annual financing for distributed generation, particularly solar photovoltaics, grew from \$20 billion in 2016 to \$110 billion in 2020, but it remains below estimated financing needs (IEA 2023). Distributed renewable energy is still perceived as risky due to factors such as uncertainty about how technologies will perform, revenue volatility, off-taker credit risks, and policy or regulatory changes.

<sup>3</sup> The clean cooking sector is highly fragmented with an estimated 450–500 manufacturers and distributors in operation in 2020. However, just 10 percent of these enterprises were responsible for 40 percent of stove sales (WEF 2023).

<sup>4</sup> The top three countries—China, India, and Brazil—account for more than three-quarters of total investment.

### Small-scale Agribusiness

For the purposes of this research, small-scale agribusiness refers to businesses that offer support services to smallholder farmers and agri-processing players, including knowledge transfers, agricultural inputs, financial resources, and technology resources.<sup>5</sup> These support services aim to improve the efficiency and/or sustainability of agricultural practices. Small-scale farms of less than five hectares of land represent an estimated 95 percent of world's farms and they grow up to 80 percent of the food produced in Asia and Sub-Saharan Africa (CPI 2020). Women play a critical role in these agricultural production systems, but they are often undervalued or poorly remunerated.

Support services in small-scale agribusiness could drive several SDG outcomes. For example, improving women's access to agricultural services and technologies could increase their productivity and improve their livelihoods. In addition, building the sustainability of small-scale agribusiness can deliver outcomes related to climate mitigation and food security. This is particularly relevant as the agriculture sector accounts for approximately

one-fifth of global greenhouse gas emissions and rising global temperatures are negatively impacting crop productivity and food security (World Bank Group 2021, Jägermeyr et al. 2021).

Climate finance targeting small-scale agrifood systems is far from meeting the needs of producers and supply chain actors. Between \$300-350 billion annually is required for the transition towards sustainable food systems and land use, while also addressing climate change issues (The Food and Land Use Coalition 2019). However, just \$5.53 billion, or 0.8 percent, of climate finance tracked globally goes to small-scale agrifood systems and this is less than 20 percent of investment flowing to the agriculture sector as a whole (Climate Policy Initiative 2023).

While it is difficult to determine total financial needs for small-scale farmers and agricultural enterprises, some estimates suggest that \$240 billion is required annually to cover agricultural inputs, investments in mechanization, and non-agricultural household expenses such as healthcare, home improvements, and school fees (Shakhovskoy et al 2019). Just 30 percent of this figure is being met, leaving an estimated financing gap of \$170 billion.

**Table 1: SDGs Associated with Clean Cooking, Distributed Renewable Energy, and Small-scale Agribusiness**

Target Sector	Examples of Relevant Sustainable Development Goals
<b>Clean Cooking</b>	<ul style="list-style-type: none"> <li>• SDG 3 – Good Health and Well-being</li> <li>• SDG 5 – Gender Equality</li> <li>• SDG 7 – Affordable and Clean Energy</li> <li>• SDG 13 – Climate Action</li> </ul>
<b>Distributed Renewable Energy</b>	<ul style="list-style-type: none"> <li>• SDG 3 – Good Health and Well-being</li> <li>• SDG 4 – Quality Education</li> <li>• SDG 5 – Gender Equality</li> <li>• SDG 7 – Affordable and Clean Energy</li> <li>• SDG 8 – Decent Work and Economic Growth</li> <li>• SDG 13 – Climate Action</li> </ul>
<b>Small-scale Agribusiness</b>	<ul style="list-style-type: none"> <li>• SDG 2 – Zero Hunger</li> <li>• SDG 5 – Gender Equality</li> <li>• SDG 8 – Decent Work and Economic Growth</li> <li>• SDG 13 – Climate Action</li> </ul>

\* For more details on the SDGs and outcome-based finance, please see the appendix.

<sup>5</sup> For the purposes of this research, agribusiness does not refer to its broader definition of all farming and farming-related commercial activities undertaken in the private sector. Forestry activities are excluded from this research.



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## Building the Outcome-based Market

Outcome-based finance is widely seen as an untapped opportunity to channel more funding into clean cooking, energy access, and small-scale agriculture. Given the extensive financing needs for clean cooking, distributed renewable energy, and small-scale agribusiness, there is significant interest in assessing the potential for a market to purchase SDG outcomes. Box 1 contains information about IFC's experience with outcome-based finance. However, knowledge gaps in key areas are holding back wider uptake of outcome-based finance, namely:

- *Data on outcome buyers*, including the types of institutions that buy outcomes, the commercial rationale for these buyers to purchase social and environmental outcomes, preferred payment methods, and pricing barriers.
- *Size of the outcome market*, including the current and potential size of the outcome market, co-benefits bundled to carbon, and standalone SDG outcomes.
- *Social outcome metrics, methodologies, and standards* to measure, quantify, and verify social and environmental outcomes, which are vital to ensure the integrity of purchased outcomes.

The research scope and methodology to explore these knowledge gaps is presented in Section II. Section III shares findings on outcomes sold through the voluntary carbon market, Section IV shares findings on outcomes sold in standalone SDG outcome markets. Section V concludes with recommendations.

### Box 1: IFC's Experience with Outcome-based Finance

**IFC has supported several pilots that use innovative outcome-based finance, and it is now exploring how to replicate and scale these projects.** IFC was a key partner in the Clean Impact Bond, the first development impact bond in clean cooking. This bond quantified and sold health and gender outcomes separate from carbon credits to generate cashflows for an enterprise supplying modern energy cooking solutions for women and other customers at the base of the pyramid.<sup>i</sup> IFC also supported the development of Distributed Renewable Energy Certificates (D-RECs), which aim to monetize the positive climate impacts of communities using distributed renewable energy and it is now exploring how to advance the market. In Sub-Saharan Africa, IFC supported BIX Capital, an impact investor addressing climate change, financial inclusion, and gender inequality by providing access to finance for small and medium enterprises that provide clean, energy-efficient cookstoves, water purification systems, and biogas digesters to low-income women and their families.<sup>ii</sup> As of June 2022, BIX has helped enterprises reach over 14 million people at the base of the pyramid and avoided over 2.5 million tons of greenhouse gas emissions.

<sup>i</sup> See IFC's [Clean Impact Bond: Mobilizing Finance for Clean Cooking](#).

<sup>ii</sup> BIX Capital B.V. is an investment vehicle based in the Netherlands, which is part of FOUNT, Cardano Development, and the Shell Foundation.



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# II. Scope & Methodology

## Research Scope

This research covers outcomes that are bought and sold within and outside the voluntary carbon market (see Figure 2). In particular, it explores carbon credits, carbon credits bundled with SDG co-benefits, and standalone SDG credits for outcomes in the clean cooking, distributed renewable energy, and small-scale agribusiness sectors. To differentiate between outcome buyers and to understand their unique preferences and motivations for purchasing SDG outcomes, research findings are organized into two parts: inside the voluntary carbon market and outside the voluntary carbon market.

### Part 1. Inside the voluntary carbon market:

This research considers two types of credits. The first are carbon credits with additional social or environmental co-benefits claimed alongside their carbon mitigation benefits. These are often referred to as 'charismatic carbon' credits. These can also include carbon credits that specifically quantify and verify their SDG-linked social and environmental outcomes, which may drive an additional pricing premium.

This research also explores a second type of credit derived from standalone SDG outcomes unbundled from carbon. These outcomes make no carbon emission reduction claims but are validated and verified through voluntary carbon market mechanisms. SDG-outcome transactions are only emerging, for example through Verra's Sustainability Development Verified Impact Standard Program and the Gold Standard Certified SDG Impacts, which are examined in Section III.<sup>6,7</sup>

### Part 2. Outside the voluntary carbon market:

This paper also considers transactions that occur outside of the voluntary carbon market, with a focus on standalone SDG outcomes. There has been some progress in building SDG

outcome markets that are entirely unconnected to the voluntary carbon market, but transactions remain scarce and most outcome buying activity has been limited to specific time-bound projects.

## Data Collection and Methodology

The methodology for this research relies on a mix of quantitative and qualitative techniques. The following inputs were used to generate the findings and conclusions of this report:

1. **A literature review** covered a wide range of publications, working papers, policy briefs, news articles, and case studies to contextualize the research findings on the current state of the outcome buyers market, as well as lessons learned from other outcome-based transactions.
2. **Key informant interviews** generated qualitative insights on the experiences and challenges of outcomes buying in greater depth. A total of 54 interviews were conducted with a broad range of market actors, including potential corporate buyers, official development partners, impact investors, financial intermediaries, carbon project developers, and philanthropic foundations. Interviewees were generous with their insights when discussing trends in general terms but were understandably less willing to discuss specific strategies or commercially sensitive information. The concept of distributed renewable energy was not as well understood for actors operating outside of the energy sector, resulting in less engagement on this topic.
3. **A survey** of potential outcome buyers and organizations with knowledge of outcome-based transactions garnered 43 responses from buyers, end users, investors, brokers, consultants, advisors, project developers, and others in a range of sectors (see figures 3 and 4).

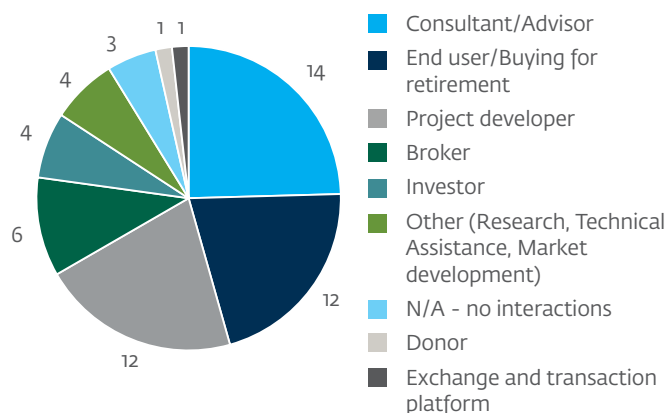
Figure 2: Outcome Markets Inside and Outside the Voluntary Carbon Market



<sup>6</sup> In August 2023, Verra, a standard for certifying carbon credits to offset emissions, published the Methodology for Time Savings from Improved Cookstoves, which seeks to quantify the time savings achieved by households switching to clean, efficient cookstoves.

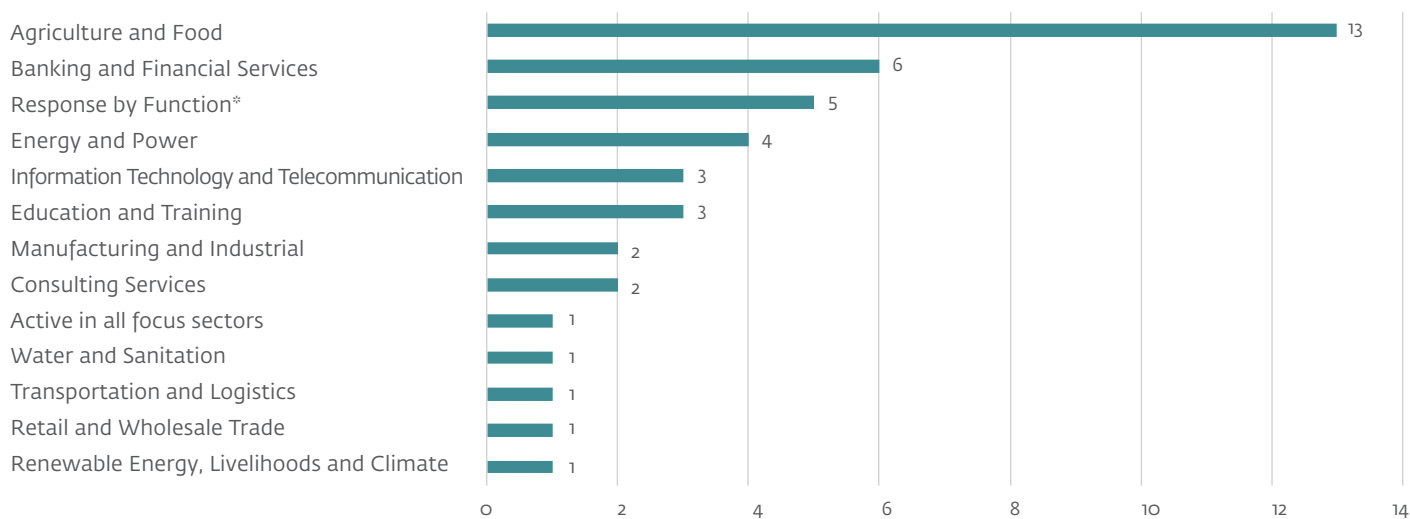
<sup>7</sup> To date, Gold Standard has published six Certified SDG Impact Methodologies.

**Figure 3: Profile of Survey Respondents and How They Transact in the Carbon Market**



4. **Analysis of voluntary carbon market data** using MCSI Carbon Markets Intelligence (formerly Trove Research), and supplementary data from AlliedOffsets.<sup>8</sup> This complemented the survey results with a market-wide view of transactions in the voluntary carbon market focused on clean cooking, distributed renewable energy, and small-scale agribusiness. It examined pricing trends and pricing premiums derived from SDG co-benefits. While underlying individual projects are not identified to preserve anonymity, MCSI Carbon Markets categorizes projects into sectors, and these were matched to the three focus areas of clean cooking, distributed renewable energy, and small-scale agribusiness.<sup>9</sup> Data on pricing was also limited, making it difficult to detect pricing premiums for specific project categories or those where outcomes were confirmed by specific verification bodies.

**Figure 4: Survey Respondents by Sector of Primary Focus**



\* Survey respondents who reported a primary function rather than a primary sector of focus: Carbon Credit Broker (1), Carbon Project Developer (1), Consultant (1), Government (1), Development Cooperation (1).

<sup>8</sup> MCSI Carbon Markets (formerly Trove Research) is a subscription-based service offering access to a data platform on voluntary carbon market transactions, projects, corporate commitments, and pricing trends. AlliedOffsets is a data and analytics firm focused on the voluntary carbon market, which combines an AI-driven model with manual matching to pair corporate entities with credit retirement data.

<sup>9</sup> Clean cooking projects have their own category in the platform, while distributed renewable energy projects were parsed by filtering for 'small scale' project types within the wider renewable energy project category. Agribusiness projects were mapped to 'agricultural land management', as forestry projects are excluded in this research. There is relatively little data available on agricultural land management as the methodology is new.

# III. Part 1: Inside the Voluntary Carbon Market

## Types of Buyers and Market Dynamics

There are two main types of outcome buyers transacting in the voluntary carbon market:

- **Buyers that trade carbon credits:** Buyers who trade carbon credits tend to purchase at scale, with the goal of selling for profit. Carbon credit traders are particularly sensitive to market sentiments that influence pricing. Many financial institutions, such as Standard Chartered and Goldman Sachs, as well as large energy corporates, like BP and Shell, have carbon credit trading teams that buy credits as part of their sustainability strategy with the intention to sell them to end buyers.
- **End buyers that retire carbon credits:** Buyers who buy carbon credits with the intention to retire them and claim the climate impact are known as end buyers. Typically, they are motivated by the need to meet corporate climate or sustainability targets. Findings from the key informant interviews suggest that their motivations vary for setting and meeting these commitments, but they can include managing reputational risks, satisfying investor or employee concerns around climate and social impact, and preparing for future regulations related to greenhouse gas emissions. End buyers who retire credits are the focus of this analysis.

### **A relatively small number of end buyers are responsible for the majority of purchases of carbon credits for retirement.**

Between 2019 and 2023, the most active end buyers by volume of credits were three multinational corporates: Delta Air Lines, Shell, and Volkswagen. Roughly 5.5 million carbon credits have been retired for the clean cooking sector, while the combined volume of retirement for distributed renewable energy and small-scale agribusiness projects is just 7 percent of that amount. However, given the breadth of project types they encompass, transactions for distributed renewable energy and small-scale agribusiness are not easily identifiable in the voluntary carbon market. Furthermore, obtaining a complete view of end buyers is challenging because there is no central registry of retirements. AlliedOffsets data draws from publicly available information, but 40 percent of retirements are anonymous, making it impossible to analyze all activity across the voluntary carbon market for the three sectors of focus.

**The voluntary carbon market is highly intermediated, with brokers playing a significant role.** Brokers hold information on market dynamics and prices and serve as intermediaries between large corporates and smaller project developers. They also play a significant arbitration role. According to insights shared in key informant interviews, approximately 75 percent of all transactions are carried out through brokers, rather than via a centralized exchange or direct seller-buyer engagement. Brokers

can aggregate credits from different projects to sell to buyers and in turn, represent a significant portion of off-take demand. While brokers can link project developers to credible carbon credit buyers, this often forces project developers to accept lower prices than if they transacted directly with end buyers. Anecdotes from interviewees indicate brokers retain up to 50-60 percent of a credit's final purchase price, particularly if the broker plays a role in the development of the project.

In clean cooking, distributed renewable energy, and agribusiness, data from AlliedOffsets indicates that Korean brokers who intermediate on behalf of organizations to retire credits dominate in regard to retirement volumes, along with companies such as Nespresso, Samsung, Shell, Delta, Nedbank, Standard Chartered, and Octopus Energy.

## Pricing and Buyer Motivations

**Buyers transacting in the voluntary carbon market exhibit diverse purchasing behaviors driven by factors such as portfolio diversification, volume considerations, and greenwashing.** These buyers range from those seeking to build diversified portfolios by purchasing different types of credits at varying prices to others with large carbon footprints aiming to secure significant volumes of credits at low average prices. Additionally, transparency in revenue sharing and a focus on quality-driven purchases, especially regarding social and environmental co-benefits, are becoming increasingly important considerations for buyers. The following considerations were found through this research:

- **Diversification:** Some buyers may purchase different types of credits at varying prices to build a diversified portfolio for their climate or sustainability commitments.
- **Volume:** Some buyers have a large carbon footprint and purchase a significant number of carbon credits. Their aim is to secure a low average price per credit. These volume and budget considerations likely mean that carbon credits with co-benefits ('charismatic credits') will only comprise a small share of their overall carbon purchase portfolio, as these credits typically demand a price premium.
- **Reputational risks:** A 2023 survey by Conservation International and the We Mean Business Coalition found 44 percent of corporate leaders ranked accusations of greenwashing as their greatest concern when participating in the voluntary carbon market (2023). Reputational concerns drive buyers towards higher-quality carbon credits or credits that have verified SDG co-benefits. For example, in the clean cooking sector, buyers apply additional scrutiny to avoid accusations of greenwashing and show greater interest in defining and procuring high-quality credits ([Clean Cooking Alliance 2023](#)). Buyers transacting in relatively new sectors,

such as distributed renewable energy, are typically conscious of the credibility issues that have plagued the trade of carbon credits ([Canary Media 2023](#)). Buyers are also willing to commit more funding to the most credible carbon credits that exhibit permanence and additionality and are verified by reputable actors ([Clean Cooking Alliance 2023](#)).

- **Experience:** Greater public scrutiny regarding the credibility and integrity of carbon credits traded in the voluntary carbon market has attracted more sophisticated players to the market. These are typically buyers with longer engagement in the voluntary carbon market and more developed strategies for buying carbon offsets. These actors are more likely to demand high-quality carbon credits, including those with SDG co-benefits.
- **Transparency:** More buyers are asking for clear information about the proportion of revenue that project developers and their beneficiaries receive from credit sales. As noted earlier, the high degree of intermediation in the voluntary carbon market means that majority of carbon revenue goes to brokers. However, over 80 percent of outcome buyers surveyed said they would pay more for credits if revenues were shared more equitably between brokers and beneficiary communities or customers. Interviews also showed that projects with fairer revenue-sharing are perceived as producing better quality credits. In response, new platforms are emerging that make transactions fairer by connecting credit buyers directly with project developers (see Box 2).
- **Quality:** Some buyers are more likely to buy high-quality carbon credits with social co-benefits. This includes consumer-facing brands where the company's reputation for sustainability is important to the customer, such as sustainable fashion apparel companies. It also includes buyers who have high revenues per ton of carbon emitted, such as technology companies. This type of buyer has relatively low emissions, does not transact in high volumes, and can afford to pay higher prices for carbon credits with SDG co-benefits.
- **Standards and best practices:** The rise of new standards and best practices in corporate sustainability has increased demand for various types of credits. For example, recommendations by market players such as the Science Based Target Initiative (SBTi) have driven an increase in carbon removal credits, rather than carbon avoidance credits.<sup>10</sup> This trend has also impacted the price of carbon credits, with emissions removal projects benefitting from a premium over reduction projects ([Deloitte 2023](#)).

### Box 2: Acorn Platform Encourages More Equitable Revenue Splits

Run by Rabobank, the Acorn platform supports smallholder farmers across the globe to adopt climate-smart and carbon-capturing agroforestry practices, which improves agricultural yields, increases biodiversity, and improves soil quality through the planting and integration of different plant species. Acorn then helps these smallholders sell carbon credits to corporates interested in purchasing high quality credits.

Participating smallholders receive 80 percent of the revenue generated from the sale of their carbon credits in the form of cash and in-kind support. To reduce costs and facilitate scale, satellite technology is used to monitor and evaluate outcomes. To date, Acorn has issued over 255,000 carbon removal units generated by 20 projects across 12 countries, and these have supported more than 240,000 farmers. Credits are certified by Plan Vivo, and buyers include Microsoft, Standard Chartered, and Bain & Company.

Source: [Acorn](#), November 2023.

### Co-benefits and Pricing in Clean Cooking, Distributed Renewable Energy, and Agribusiness

There is an expectation among market actors that the presence of co-benefits will increase the price of carbon credits in clean cooking, distributed renewable energy, and small-scale agribusiness. Approximately half of the survey respondents said that credits in these sectors demand a premium compared to other credit types, with the average premium estimated to be between 11-30 percent. For all three sectors, outcomes related to gender equality and livelihood creation were deemed the most common drivers of price premiums, while health, energy access, and biodiversity were additional drivers for clean cooking, distributed renewable energy, and agribusiness respectively.

Aggregate data indicates that credits with SDG co-benefits demand higher prices when they are linked to four or more SDGs. However, this was not consistent across the assessed

<sup>10</sup> The [Science Based Target initiative](#) provides companies with pathways towards setting and achieving their own credible net-zero commitments. It recommends that most companies' emissions abatement should be achieved through the reduction or removal of carbon in a company's value chain. However, companies should also consider using avoidance credits, such as those produced by clean cooking, distributed renewable energy and some small-scale agribusiness ([SBTi 2022](#)).

time period. No premium was observed for projects associated with three or fewer SDGs.<sup>11</sup> This was supported by qualitative insights from interviews, which suggested that a range of co-benefits are generally preferred over specific SDG outcomes, with the exception of gender equality, once buyers are educated on the scope of the associated carbon credits.

**Evidence indicates that some buyers will pay a premium for gender equality outcomes, and this is likely driven by the quality of the credit.** Survey results show that gender equality is the most popular SDG theme among outcome buyers with a corporate SDG commitment. However, interviews indicate that carbon buyers only become interested in these credits once they are made aware of the potential benefits of clean cookstoves, distributed renewable energy, or small-scale agricultural services on gender outcomes. This finding is supported by MSCI Carbon Markets (formerly Trove Research) analysis, which found a statistically significant price premium for gender equality SDG credits across the voluntary carbon market, while other individual SDGs did not have a statistically significant impact on prices.

**Average prices across the market obscure substantial variation among individual credit prices.** AlliedOffsets data shows that since 2020, 46 percent of retired cookstove credits were bought for less than \$8.00 each. However, a few outlier transactions, accounting for less than four percent of the sample, drove the average price to \$10.23. This was substantiated in interviews, where market participants said that other factors have a significant impact on credit price, such as the ability to develop a strong impact narrative around the purchased credit. These can lead to large variations in credit prices secured by projects within the same sector. Furthermore, insights shared by experts suggest that price premiums cannot be observed consistently for charismatic carbon credits, despite their claims to deliver additional social or environmental co-benefits alongside the value of the carbon mitigation benefit.

**Premiums attached to SDG co-benefits vary greatly.** When it comes to pricing, buyers evaluate a project holistically rather than assessing individual project components or co-benefits. For example, clean cooking projects, which are typically regarded as charismatic carbon projects, not only reduce carbon emissions but also deliver social co-benefits that support women by increasing their economic empowerment and by delivering health benefits. These are generally associated with higher average prices than 'carbon only' projects. However, beyond clean cooking, the presence of SDG co-benefits is likely to be only one of many factors that influence credit prices.

**Aside from buyer preferences expressed in pricing and pricing premiums, the majority of outcome buyers do not appear to be significantly motivated by co-benefits of projects.** When buyers were asked what influenced their transactions in clean cooking, distributed renewable energy, or agribusiness credits, they ranked SDG co-benefits fourth out of 11 factors. Buyers also ranked SDG co-benefits as the ninth most important factor that would *prevent* them from buying credits in these sectors. This indicates that co-benefits are generally not a determining factor in transactions.

**Aside from price, demand for credits is also influenced by the presence of SDG outcomes, the revenue-sharing model, operational alignment, geographical factors, market standards, reputational concerns, and the buyer's maturity.** Buyers tend to prefer credits sourced from locations where they operate or have a strong customer base. Buyers also prefer credits that align thematically with their business operations, as this can support their marketing and sustainability narratives. In some cases, this means that buyers pay closer attention to credits that demonstrate social and environmental impact, including carbon credits with SDG co-benefits and standalone SDG credits. For example, a consumer goods company that employs large numbers of women in its agricultural supply chain may target the purchase of carbon credits that include gender outcomes. See Boxes 3 and 4 for a closer look at credits in the three focus sectors.

<sup>11</sup> MSCI Carbon Markets (formerly Trove Research), September 2023, 'Impact of project co-benefits on carbon credit pricing.' (Not publicly available).



Photo credit: iStock Jenchi Eri, 1717738364

### Box 3: A Closer Look at Clean Cooking and Distributed Renewable Energy Credits

Clean cooking and distributed renewable energy credits share several characteristics that determine their attractiveness to buyers. For example, most survey participants said carbon credits from clean cooking and distributed renewable energy projects have a strong social impact story and this generates a price premium in the voluntary carbon market. In particular, clean cooking projects were seen as community-focused and driven by social impact. Clean cookstove credits tended to sell for a higher price of \$6.50 to \$12.50 per credit compared to distributed renewable energy which averaged \$5.00 per credit in 2023.<sup>i</sup>

Buyers also appreciate the speed at which project developers can produce carbon credits through clean cooking and distributed renewable energy. Shortly after clean cookstoves or solar home systems are distributed and deployed—and usage verified—project developers can calculate carbon avoidance from households that have switched from carbon-intensive generators or polluting cookstoves to cleaner solutions, and then sell these credits to interested buyers.

However, the integrity and demand for carbon credits from clean cooking projects are at risk from the phenomenon of ‘stove

stacking’, whereby households may purchase a cleaner cookstove but still use more polluting and carbon-intensive stove-and-fuel cooking combinations. This reduces the creditability of the associated carbon credits. Furthermore, according to the interviews conducted for this research, most carbon credits produced in clean cooking are from selling ‘lower tier’ or ‘improved cookstoves’ rather than higher tier stoves which are cleaner, more efficient, and deliver greater health impacts. Often these lower tier cookstoves claim health benefits, but in the absence of robust methodologies for measuring such outcomes, these credits have less potential to secure pricing premiums.

Carbon credits from distributed renewable energy projects retain demand when they are differentiated from general renewable energy projects, which may no longer be eligible for carbon finance. Bodies that set carbon standards have restricted eligibility for large-scale renewable energy projects due to additionality concerns in settings where the cost of renewable technology has fallen.<sup>ii</sup>

<sup>i</sup> Based on price data derived from MSCI Carbon Markets (formerly Trove Research) and a point estimate for small-scale renewable energy based on higher demand for renewable energy in general.

<sup>ii</sup> Additionality refers to the extent to which carbon credits represent a reduction or avoidance of CO<sub>2</sub>e emissions from a project that would not have occurred without the carbon finance generated through credit sales.

### Box 4: A Closer Look at Small-scale Agribusiness Credits

Agribusiness covers a wide range of projects across carbon avoidance and removal, such as adapting rice farming, reducing methane emissions, planting shade trees, and making energy efficiency gains in agri-processing. Issuances of carbon credits from these agribusiness projects, some of which are classified under ‘sustainable land management’, only began to take off in 2020 and transaction volumes are low compared to other project types.<sup>i</sup> According to several interviewees, the projects with the most significant SDG co-benefits are likely to be those that work directly with farmers, particularly smallholders.

Smallholder farmers are often income-constrained and may view new climate-smart, regenerative farming techniques as risky due to a lack of information on potential benefits. Financial incentives

for smallholders must align with these perceived risks to ensure that smallholders follow new climate-smart farming practices in the long-term. Smallholders are unlikely to engage with project developers unless they receive a significant portion of the revenues generated from the sale of credits. This, in combination with the relatively high costs of verification in agribusiness in comparison to clean cooking and distributed renewable energy, make projects in this sector unattractive unless there is an assured price premium for the carbon credits they generate. Based on limited data from MSCI Carbon Markets (formerly Trove Research) on the average carbon credit price in agricultural land management projects project developers may require a carbon price at \$13 per credit generated to make projects viable.

<sup>i</sup> MSCI Carbon Markets (formerly Trove Research) issuances for the project type ‘agricultural land management’.

## The Future Market, Challenges, and Opportunities

### *Demand Side Considerations for Outcome Buyers*

**Both positive and negative factors are likely to influence future buyer demand for carbon credits in clean cooking, distributed renewable energy, and small-scale agribusiness.**

On one hand, demand will grow when more institutions and corporations make voluntary climate commitments, for example aiming for net zero emissions or setting science-based targets. Increasing pressure on corporations to reduce their Scope 3 emissions, which are the indirect emissions arising in a corporation's value chain, will also drive demand for offsetting activities. However, efforts by regulators and corporates to directly reduce emissions by using renewable energy instead of fossil fuels may decrease the need to offset emissions through the purchase of carbon credits. Negative media coverage of

the voluntary carbon market and concerns about the integrity of carbon credits or greenwashing could also decrease buyer demand.

**The operationalization of the Paris Agreement will have significant bearing on the future trajectory of the voluntary carbon market.** Article 6 of the Paris Agreement outlines principles to govern the trade of international carbon credits. This goes beyond the Kyoto Protocol, where the Clean Development Mechanism governed the international trade of carbon credits for countries to meet their emissions targets. Under Article 6.4 of the Paris Agreement, a UN-led supervisory body will oversee a global carbon market in which UN-approved carbon credits can be purchased by countries, companies, and individuals. While the supervisory body was formed in 2023, there has not yet been an agreement on carbon standards, and this has created uncertainty in the voluntary carbon market (see Box 5).

### **Box 5: Article 6 of the Paris Agreement**

The Paris Agreement enables countries to cooperate to achieve emission reduction targets set out in their Nationally Determined Contributions (NDCs). Under Article 6, any country can transfer carbon credits from the reduction of greenhouse gas emissions to help other countries meet their climate targets. Article 6.4 establishes a mechanism for trading reductions internationally. It will be supervised by the Conference of Parties, a decision-making body of the UN Framework Convention on Climate Change (UNFCCC) and is expected to be similar to the Clean Development Mechanism established under the Kyoto Protocol.

While emission reductions may be transferred, only one country may count these credits towards its NDC. This 'corresponding adjustment' avoids double counting or overestimating of emission reductions.

Under Article 6, corresponding adjustments may become a requirement in the voluntary carbon market. In 2023 this uncertainty made buyers hesitate and led to lower demand. However, the voluntary carbon market is still expected to grow in the long term, with new standards likely to build trust and integrity.



Photo credit: Freepik, 1241144



**The integrity of carbon credits will be a key influence on market demand.** Adverse media coverage has already contributed to lower demand across the voluntary carbon market. A 2023 investigation by The Guardian newspaper into the Reducing Emissions from Deforestation and Forest Degradation project (known as 'REDD+') claimed more than 90 percent of rainforest carbon offsets certified by Verra did not represent genuine carbon reductions. It alleged that of the almost 95 million credits claimed, less than six million tons of emissions were mitigated (The Guardian 2023). UC Berkeley found that emission reductions from cookstove projects were over-credited an average of 6.3 times (Gill-Whiel et al. 2024). These findings have raised questions around the integrity and additionality of carbon credits and the verification standards that underpin their value in the market. The controversy over greenwashing saw many potential buyers hold off purchasing credits.<sup>12</sup> While carbon buyers are still primarily focused on the environmental integrity of credits, market players also anticipate that standard-setting bodies will apply greater scrutiny to social co-benefits.

**Some quasi-regulatory efforts could enhance the integrity of credits in the voluntary carbon market.** For example, the Integrity Council for the Voluntary Carbon Market established ten principles that aim to ensure high-integrity carbon credits through rigorous thresholds for transparency and sustainable development. Some market players believe such initiatives will help to boost demand. Others view the market's transition towards removal credits rather than avoidance credits as a sign of growing interest in environmental integrity and impact. However, demand for removal credits exceeds available supply. In sectors like clean cooking, distributed renewable energy, and agribusiness, only a limited number of interventions would qualify as removal.

**Advances in the monitoring, reporting, and verification of outcomes may help to increase the integrity of carbon credits.** Buyers only pay for outcomes that have been verified, which makes the ability to collect and verify data in a cost-effective manner central to purchasing outcomes. Box 6 contains an example of a digital innovation that tracks the generation of carbon credits for clean cookstoves, solar water pumps, or other devices in real time. If digitally-enabled tracking is feasible and project developers have the funding and capacity to install these systems, they could reduce risks of over-crediting, improve monitoring, reporting, and verification processes, and build credibility with buyers.



Photo credit: iStock Konstik, 152958991

#### **Box 6: ATEC Global and Digital Monitoring, Reporting, and Verification**

ATEC Global has developed an electromagnetic induction cookstove that leverages Internet of Things-sim technology to track usage data. Each stove is connected to ATEC's digital platform, which automatically validates usage for up to 15 years. ATEC converts usage into 100 percent data-verified carbon credits, ensuring the integrity of the credits.

ATEC, the FairClimateFund, and Modern Energy Cooking Services have joined forces on a pilot to share carbon credit revenues with households, based on verifiable usage data. ATEC's stoves will track live usage data and make micropayments directly into households' mobile money accounts, providing a financial incentive to adopt clean cooking.

Source: ATEC Global. 2023.

<sup>12</sup> For example, Shell has pulled back from plans to purchase up to \$100 million worth of carbon credits annually as part of its climate strategy.

### *Supply Side Challenges for Project Developers*

**Costs associated with developing carbon projects can be prohibitive for smaller enterprises in clean cooking, distributed renewable energy, and small-scale agribusiness.**

Developers must consider the costs of pre-feasibility and feasibility studies, preparation of project design documents, project registration, and ongoing monitoring, reporting, and verification, as well as transactions costs stemming from identifying and building relationships with buyers or brokers. Expensive external expertise is often required to navigate the process. These are major deterrents for smaller, revenue-constrained enterprises that have not reached sufficient scale to spread the costs and ensure project viability. Access to pre-finance is essential for smaller enterprises to develop carbon projects. However, investor perceptions of risk, a lack of investment readiness, and exchange rate risks when importing cookstoves or other equipment and selling it in local currency, make it challenging to mobilize finance in the target sectors.

**A lack of price transparency makes it difficult for service providers and smaller carbon project developers to assess whether projects will be commercially viable.** Without clarity on the price that carbon credits might command, projects cannot take off, particularly those run by smaller enterprises or those that focus on harder to reach communities where operational costs are higher. For example, it is more resource intensive for a firm to work with lower-income, smallholder farmers than with formalized, contracted farmers. Project developers are therefore disincentivized to work with these communities unless they know they will receive premiums for

their carbon credits that offset these additional costs. All being equal, this makes it more challenging to develop voluntary carbon market projects that target base of the pyramid, low-income, or marginalized communities.

**Without clearer price signals in the voluntary carbon market, project developers are unlikely to invest in new technologies and verification processes that could improve the quality of their credits.** For example, service providers in the clean cooking, distributed renewable energy, and small-scale agribusiness sectors would be less likely to invest in digital monitoring, reporting, and verification innovations, update their legacy data systems, and train staff in these new technologies without a guarantee that the costs would be offset by consistent price premiums for their carbon credits.

**The voluntary carbon market does not favor new project developers or service providers that lack established relationships with buyers.** Given the complexity of transacting in the market and concerns surrounding the integrity of credits, outcome buyers typically prefer to work with project developers with whom they have a successful track record. This makes market entry difficult for new projects and service providers. While some project developers may have in-house capacity to develop carbon trading projects and identify buyers, smaller players will likely need an external carbon project developer and brokers. This reduces revenue feeding back to grow and scale their operations. Even if sellers can identify large corporates as potential buyers, carbon credit purchases may originate in more than one team within that corporate, making it difficult to pinpoint the right buying counterpart.



Photo credit: Adol Stock Riccardo Niels Mayer, 512926691

# IV. Part 2: Outside the Voluntary Carbon Market

## The Building Blocks of an SDG-Outcomes Market

While there are currently no established markets outside the voluntary carbon market for transacting SDG outcomes, building blocks exist for market mechanisms that could transact standalone SDG outcomes independent from carbon credits. As shown in Figure 5, the four main building blocks for such a market mechanism are:

- 1.) Buyers that are interested in purchasing SDG outcomes
- 2.) Sellers that are capable of creating these outcomes through projects
- 3.) Tools for defining, measuring, and verifying outcomes
- 4.) A market structure connecting buyers and sellers

This research focuses primarily on the first building block, namely: is there buyer demand for standalone SDG outcome credits separate or unbundled from carbon credits in the voluntary carbon market? It also examines outcome verification and market structure. While not a focus of this report, the sell side, or building block two, warrants future research.

### Demand for SDG Outcome Credits

#### Building Block 1: SDG Outcome Buyers

Potential buyers of SDG outcomes in clean cooking, distributed renewable energy, and agribusiness sectors include development agencies, philanthropic foundations, and private corporations with social impact missions. Development agencies have been the most active buyers of outcomes via 'one-off' results-based finance projects. Strategic interests and mandates vary across different types of buyers:

- **Development agencies**, including official bilateral and multilateral donors, have a socioeconomic development mandate for their funding, which include conventional grants, results-based finance, concessional lending, pull

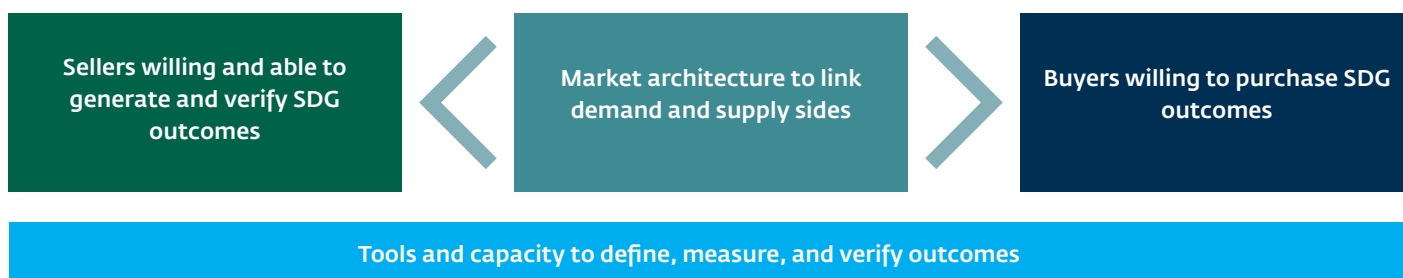
financing mechanisms, and contributions to blended financing instruments.<sup>13,14</sup>

- **Development finance institutions**, whether bilateral or multilateral, have access to non-returnable concessional funding for technical assistance or advisory services that can facilitate SDG outcome transactions, but this is limited and rarely a source of funding for outcome buyer purchasing.
- **Private philanthropic foundations** may be motivated by wide-ranging development goals and can provide flexible support. This includes results-based finance, early-stage pilot project grants, funding for institutional capacity building, patient equity, and debt capital.
- **Private corporations** are beginning to mobilize investments to achieve both business and social goals ([Macpherson et al. 2021](#)). This commitment is reflected in the private sector's active presence in the voluntary carbon market and its embrace of diversity, equity, and inclusion, corporate social responsibility, and wider sustainability efforts. However, to date there have only been few transactions for SDG outcomes outside the voluntary carbon, which suggests a need for corporate engagement in the SDG-outcome space.

**Corporate and philanthropic foundations appear to be interested in purchasing SDG outcomes from the target sectors, but more effort is required to scale that commitment.**

One-third of survey respondents expressed interest in buying SDG outcomes. However, during interviews key informants consistently raised a lack of transactions as a sign that this interest is not readily converted into funding commitments. One interviewee engaged with more than 100 potential corporate SDG buyers but at the time of the interview, only two had expressed interest in piloting a transaction. For corporates, the difference between their stated preferences and their funding of SDG outcomes could be attributed to the absence of reputational, regulatory, or business imperatives around SDG outcomes.

Figure 5: Building Blocks for Developing an SDG-outcomes Market



<sup>13</sup> Pull financing mechanisms reward successful solutions that meet predetermined criteria, and can take several forms, including prize challenges, subscription models, milestone payments, and advance market commitments. Pull financing can incentivize the private sector to innovate to solve hard-to-tackle social problems ([Center for Global Development 2023](#)).

<sup>14</sup> In the period 2019–2021, an average of 29 percent of total bilateral official development assistance was allocated to climate objectives (OECD 2023).

**Energy access has been the dominant focus of results-based finance projects to-date**, and while results-based finance is less common in the agribusiness sector, there are some examples.<sup>15</sup> These projects have piloted different approaches to drive better performance and to ensure accountability of results. However, they have been limited to specific geographies, with pre-defined delivery periods, and have not provided a steady flow of outcomes funding. Table 2 provides a small sample of results-based finance initiatives implemented in each of the target sectors.

**The majority of existing results-based projects link payments to the achievement of outputs** such as the number of households connected or the number of cookstoves distributed, rather than outcomes such as amount of energy used or improvements in women's 'Quality Time'.<sup>16</sup> Key informant interviews, however, confirmed a shift in interest away from outputs towards funding for outcomes. Outcomes are more difficult to measure and may take longer to observe. Moreover, some organizations are not set up to commit funding for outcomes achieved across multiple years or when there are large time gaps between the commitment of funds, when outcomes are agreed upon, and when outcomes are quantified and verified, and their disbursement. This poses a particular challenge for project developers in sectors like agribusiness, where more time is required to achieve desired outcomes and to demonstrate their sustainability. Creating financing structures with longer time horizons may need patient capital and higher risk tolerance.

**Looking forward, gender-related SDG outcomes are of most interest to potential buyers with an SDG commitment both inside and outside the voluntary carbon market.** Twenty-five percent of survey respondents expressed interest in purchasing credits related to gender impact, separate from carbon emissions reductions. In comparison, only 15 percent said they would purchase credits of other co-benefits. One potential outcome buyer said for development partners gender mainstreaming is "important enough to have its own platform". A voluntary carbon market broker said that educating their clients on the value of co-benefits often revealed wider strategic interests and priorities, and this increased demand for such credits.

## Models for Replication

While there is no fully scaled market for SDG outcomes yet, early transactions could provide potential models for replication. For example, [Empower Co.](#) recently brokered a first transaction for 'W+ credits', which are marketable units that represent a verified women's empowerment benefit. These W+ credits were generated by a female-led agro-forestry project in Brazil and purchased by Capri Holdings. See Box 7 for a different method used by the Clean Impact Bond to buy health and gender impacts from the use of Systema.bio's cookstoves and biodigesters. Another example comes from Salesforce. In 2023, it agreed to buy 280,000 MWh of distributed renewable energy certificates from aggregator Powertrust to support projects in Brazil, India, Sub-Saharan Africa, and Southeast Asia ([Salesforce 2023](#)).<sup>17</sup> Lastly, Unilever, alongside the United Kingdom's Foreign, Commonwealth, and Development Office, is providing outcomes funding for a Development Impact Bond structure to reduce plastic waste in Nigeria (see Box 8).

### Box 7: The Clean Impact Bond

Launched in 2022, the Clean Impact Bond is piloting an approach to mobilize finance for small and medium enterprises by monetizing health and gender outcomes in the modern energy cooking sector. It is the product of a partnership between Cardano Development, BIX Capital, the Osprey Foundation, Systema.bio, and IFC.

Systema.bio was able to leverage a BIX Capital working capital loan secured against pre-sold health and gender impact to support its operations across 10 regions in Kenya and reach low-income customers. Osprey Foundation committed \$500,000 to pay for independently-verified improvements in averted ill health and mortality and an increase in women's Quality Time achieved through the use of Systema.bio's biogas digesters.

*Source: IFC. 2023. 'Clean Impact Bond: Mobilizing Finance for Clean Cooking'*

<sup>15</sup> For example, USAID, SDC, and IKEA Foundation supported the design and launch of the Aceli Africa investment platform which offers impact payments to agribusiness lenders whose investees deliver outcomes in food security and nutrition, gender inclusion, and climate-smart, resilient agriculture ([Convergence 2020](#)).

<sup>16</sup> Quality Time is the sum of time spent on income-generating activities, producing goods that would otherwise be bought, education, rest, and leisure.

<sup>17</sup> Modeled after the established Renewable Energy Certificate (REC), a distributed renewable energy certificate (D-REC) represents 1kWh of electricity aggregated from one or more DRE installations. They are certified, verifiable, and non-tangible environmental attribute commodities that offer a route for DRE projects in low- and middle-income countries to monetize the environmental benefits associated with zero-carbon electricity generation.



### Box 8: Reducing Plastic Waste in Nigeria

In 2023, Unilever Nigeria and Bridges Outcomes Partnership reached a \$2 million agreement to help the social enterprise Wecyclers expand plastic waste collection in Nigeria through its franchise program. Wecyclers is a reward-for-recycling platform that incentivizes people in low-income communities to exchange recyclable waste for essential goods. Unilever Nigeria and the United Kingdom's Foreign, Commonwealth, and Development Office will pay for positive program outcomes in waste collection and job growth. This will allow Wecyclers to create hundreds of jobs scaling up operations that take plastic out of the environment and turn it into raw material for industry.

Source: Vanguard. 2023. 'Unilever Nigeria strikes \$2m plastic waste collection deal with Wecyclers'

Photo credit: iStock Umesh Negi, 1170862113

**Table 2: Examples of Results-based Finance Projects**

Sector	Initiative	Outcome Buyers
Distributed Renewable Energy	Africa Enterprise Challenge Fund, REACT RBF	Swedish International Development Cooperation Agency (SIDA)
	Beyond the Grid Fund for Africa	SIDA, USAID Power Africa, Ministry of Foreign Affairs of Denmark, KfW Development Bank, and Norad
Clean Cooking	East Asia and Pacific Clean Stove Initiative	AUSAID, World Bank-hosted ESMAP Trust Fund
Distributed Renewable Energy and Clean Cooking	Clean Impact Bond	The Osprey Foundation
	Clean Cooking Fund	ESMAP
	Universal Energy Facility	Austrian Development Agency, Bloomberg Philanthropies, Clean Cooling Collaborative, Climateworks Foundation, Danish International Development Agency, Federal Ministry of Economic Cooperation and Development Germany, Global Energy Alliance for People and Planet, Google, IBM, Iceland Ministry for Foreign Affairs, IKEA Foundation, Ministry of Foreign Affairs and International Cooperation Italy, Mott Foundation, OPEC Fund, Rockefeller Foundation, Sequoia Climate Foundation, Shell Foundation, Swedish Postcode Foundation, UK Aid, US Agency for International Development, Power Africa
	Energizing Development (EnDev)	Foreign Commonwealth and Development Office, German Federal Ministry for Economic Cooperation and Development, the Netherlands Ministry of Foreign Affairs, Norad, Swiss Agency for Development and Cooperation
	Rwanda Energy Access and Quality Improvement Project	Co-financed by the Clean Cooking Fund
Agribusiness	Aceli Africa	IKEA Foundation, UK Aid, Ministry of Foreign Affairs of the Netherlands, Mulago Foundation, Swiss Agency for Development and Cooperation, Catalytic Capital Consortium, Feed the Future, US Agency for International Development, Good Energy

### *Building Block 3: Tools and Capacity to Define, Measure, and Verify SDG Outcomes*

**While climate, health, gender, and other SDG outcomes are recognized benefits of clean cooking, distributed renewable energy, and agribusiness projects, outcomes payments cannot be claimed without evidence of a causal relationship between a project developer's activities and the desired outcomes.** Stove stacking is one example of the challenges service providers face in measuring and attributing outcomes (see Box 3). In those instances, rather than being replaced entirely, lower-tier stoves that emit large volumes of particulates are used alongside more efficient stoves with health and gender impacts.

**Unlike carbon credits, there is no universally accepted definition or measurement unit for outcomes related to each SDG.** Eighty-one percent of survey respondents said this was a bigger barrier to enabling high volumes of transactions than a lack of market infrastructure. A standard unit of trade would reduce market friction by providing a common, easily understood benchmark for transactions. It would also facilitate smoother negotiations between buyers and sellers and enhance transparency, thereby building efficiency and trust and developing the market.

**A well-functioning market for SDG outcomes would require a shared understanding between buyers and sellers on what outcome credits represent, metrics, and how they should be measured and verified.** Some impact areas like health already have widely accepted definitions and metrics like 'averted disability adjusted life year' (ADALY), which is a measure of reductions in years lost due to ill-health, disability, or premature death (See Box 9). However, for other SDG outcomes, including gender equality, definitions and quantification are more complex and will also depend on contextual factors.

#### **Box 9: Measuring Outcomes through Averted Disability Adjusted Life Years**

An Averted Disability Adjusted Life Year (ADALY) quantifies reductions in the burden of disease or injury due to a specific intervention or preventive measure. It represents the number of years of healthy life that have been saved or gained as a result of an intervention, taking into account both years saved from premature death and years lived in good health. This metric helps assess the impact of healthcare interventions in improving the general health of a population and has been used for assessing outcomes in clean cooking projects.

### **Standards are emerging to measure women's economic empowerment across various dimensions (SDG Impact 2022).**

For example, the W+ Standard measures women's economic empowerment across six measurable dimensions and results, as detailed below. Other project developers have used proxies for women's economic empowerment, including Quality Time used in the Clean Impact Bond which measures minutes per day that women save by using cleaner cookstoves. Others have looked at women's job outcomes. For example, the [Finance for Jobs Development Impact Bond](#) in Palestine tracked job outcomes disaggregated by gender.

Emerging standards for quantifying SDG outcomes beyond carbon emissions include:

- **Distributed renewable energy certificates (D-RECs):** [D-RECs](#) seek to extend renewable energy certificates to the distributed energy space for smaller scale projects which often deliver important environmental and social value in last-mile energy distribution. D-RECs are certified, verifiable, and non-tangible commodities that allow distributed renewable energy project developers to monetize the environmental benefits associated with zero-carbon electricity generation, while allowing electricity buyers to make reliable claims about their energy usage ([Shell Foundation 2022](#)). Each D-REC represents 1kWh of electricity aggregated from one or more distributed renewable energy installations. The market for distributed renewable energy is still in development, but the [D-REC Initiative](#) aims to channel \$10 million of D-REC revenues to these projects and secure contracts for a further \$50 million by 2024 ([Saur Energy International 2023](#)).
- **W+ Credits:** Developed by the Women Organizing for Change in Agriculture and Natural Resource Management (WOCAN) in 2014, W+ credits seek to quantify women's empowerment across six dimensions: time savings, health, education and knowledge, food security, income and assets, and leadership ([W Plus](#)). One W+ credit represents a 10 percent change in women's empowerment. W+ provides metrics for projects and companies to quantify and verify women's empowerment, to translate independently verified results into W+ credits, to sell W+ credits in carbon or SDG markets, and finally, to channel financial resources back to women's organizations. At least 20 percent of the revenue is expected to return to women's groups for self-determined climate adaptation activities.
- **SD VISTA:** This program is managed by Verra, a standard for certifying carbon credits, with support from the Sustainable Development Advisory Group. It offers standards for certifying sustainable development benefits of social and

environmental projects. SD VISTA extends to 14 sectors, including gender equity, economic development, affordable clean energy, and wildlife restoration, which are also mapped to the SDGs. Projects can generate SD VISTA assets by using an approved methodology to quantify their social or environmental benefits, which must be assessed by qualified, independent third-party auditors.

**Approaches to define and measure SDG outcomes must balance rigor and costs.** Rigorous measurement of sustainability outcomes can be resource intensive, but it offers more integrity and trust to outcome buyers. Methodologies that are digitally-enabled or rely on more accepted metrics, such as ADALYs, could reduce the cost of measurement and monitoring. Social impact is inherently more difficult to standardize and quantify than carbon credits, but moving away from manual, expensive, and more error-prone data collection methods to technology-enabled solutions could improve measurement and verification processes.

#### *Building Block 4: Market Structure for Selling and Buying SDG Outcomes*

**The absence of SDG-outcome market structure was not identified as a near-term constraint to market growth but, in the long-term, some form of architecture that facilitates efficient purchasing of outcomes will be important to build demand.** As noted earlier, the lack of standardized SDG outcome metrics was seen as the most significant barrier to increasing the volume and scale of SDG-outcome buying. However, a literature review of results-based finance often flagged the resource intensity of designing and launching development projects that leverage or rely on the sale of SDG outcomes. In the absence of established market architecture, projects will continue to be largely bespoke and require patience, persistence, a long-term perspective, and sufficient resources from all stakeholders (IFC 2023).

**A standalone SDG-outcomes marketplace would require an efficient and user-friendly platform for transactions between project developers, outcome buyers, and brokers.** The voluntary carbon market already facilitates transactions between buyers and sellers, largely via dedicated intermediaries. More recently, it has also offered solutions for price discovery via exchanges such as [AirCarbon Exchange](#) and [Carbon Trade Exchange](#). No such market currently exists for standalone SDG-outcome transactions, but efforts are underway to develop digital exchange platforms focused exclusively on social and environmental outcomes. For example, [OutcomesX](#) seeks to build the market architecture for standalone SDG outcomes that can match project developers and outcome buyers (see Box 10). Another example is [Empower Co.](#), which is building the first global voluntary market for women's empowerment based

on the W+ Standard. At present however, both the number of projects for which credits can be purchased and the number of interested buyers are limited.

#### **Box 10: OutcomesX Develops a Marketplace for Social and Environmental Outcomes**

[OutcomesX](#) is a new platform that aims to build a global market for the sale and purchase of social and environmental outcomes. The platform seeks to reduce the transaction costs of fundraising efforts for project developers, while also improving accountability and transparency to attract more buyers. Using the [Impact Genome Registry](#), organizations generating outcomes report their results to the platform. These results are then cross-checked to assess the rigor and validity of the outcomes. A unit cost per outcome is calculated, factoring in the total cost of producing the outcome or 'unit of change'. Buyers can choose which outcomes they wish to purchase and from which organizations.

**The development of a standalone market will likely depend on market enablers to provide upfront financing to achieve social and environmental outcomes.** Service providers, particularly smaller, resource-constrained project developers, may face challenges funding feasibility studies, project documentation, registration, monitoring, reporting, and verification, as well as the brokerage costs required to generate and sell SDG outcomes. In addition, the commercial case for investing in SDG outcomes is much less established and this has limited the activity of corporate buyers to date. Pre-financing, largely through grant-based approaches, is likely to be required in the near term to develop SDG offtake demand. As demand rises and revenue models for SDG outcomes become clearer, more commercial forms of pre-financing may become available.

**The development of a market will also require robust regulation and governance.** For transactions to occur between project developers and outcome buyers, effective governance must be in place to ensure the integrity of credits. In the case of the voluntary carbon market, standards bodies set criteria for actors to engage in carbon project development and scale. Such regulation is not yet in place for an SDG-outcomes market. Initiatives like the United Nation Development Programme's [SDG Impact Standards](#) seek to help businesses and investors embed sustainability and the SDGs into their management and decision-making processes. However, they do not offer a standardized approach to impact accounting.



**While governance structures are minimal, regulations on the disclosure of social impacts are expected to increase, bringing greater credibility and transparency to a potential market for outcomes trading.** Europe's [Corporate Sustainability Reporting Directive](#) applies to almost 50,000 companies trading on European markets and is the first significant legislation that considers both financial and impact materiality, or the impact that a company's activities have on society and the environment ([Stanford Social Innovation Review 2023](#)). The directive, which came into force in 2023, strengthens European rules on the social and environmental information that companies must report on

to guide investors and other stakeholders. Similar regulations could provide standards on impact reporting for smaller enterprises operating in lower- and middle-income countries, generate revenue through the sale of social and environmental outcomes, and incentivize potential outcome buyers.

In addition, the Global Impact Investing Network has developed an open resource to support investors with impact measurement and management tools. The [Impact Toolkit](#) features a comprehensive database of impact-focused methods and indicators across outcomes such as biodiversity, carbon emissions, water management, forest management, and more.



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# V. Reflections and Recommendations

This report examined the use of outcome-based finance to bridge investment shortfalls in clean cooking, distributed renewable energy, and small-scale agribusiness. It discussed the dynamics of outcome-based financing, focusing on potential barriers and opportunities in the three focus sectors. It shed light on the complexities within the voluntary carbon market, emphasizing the dominance of a few buyers and the pivotal role of brokers in mediating transactions. Furthermore, it outlined the motivations of outcome buyers including pricing and reputational considerations, and the challenges faced by project developers. The report also explored the nascent market for standalone SDG outcomes, highlighting the core building blocks for driving market growth. The following recommendations could help overcome the challenges and barriers in outcome-based finance laid out in this report:

## 1. Strategic Partnerships and Co-development

Strategic partnerships involve collaboration with pioneering outcome buyers that place value on charismatic carbon and SDG outcomes. These partnerships aim to connect high-impact enterprises with clear commitments to social and environmental impact or strong brand reputation. A key strategy would include jointly developing a pipeline of carbon projects with corporates with relatively low emissions and a commitment to driving social and environmental impact. By strategically partnering with such corporates, investors and impact players can focus on supporting high-impact projects in locations where these businesses operate. This co-development approach could drive social and environmental impact, while also fostering a deeper understanding of sector dynamics among investors.

## 2. Aggregation Mechanisms

Aggregation mechanisms are designed to address market failures prevalent in the voluntary carbon market. These failures often stem from issues like intermediation challenges or low confidence in the integrity of carbon credits. Aggregation would require the creation of specialized platforms tailored for impactful projects in sectors such as renewable energy and clean cooking. Additionally, providing financing facilities would be crucial to meet the working capital needs of smaller enterprises participating in aggregation efforts. By streamlining links between buyers and sellers, these aggregation models can simplify fee structures and ensure a significant portion of carbon revenues flow back to service providers, enhancing the overall effectiveness of these initiatives.

## 3. Stronger Market Integrity and Buyer Education

A multifaceted approach is needed to improve market integrity in the context of carbon credits, including education and advocacy. Educating buyers about the merits of high-impact and high-integrity projects is crucial to overcome hesitancy and increase participation in the market. Ongoing technical assistance and advisory services are vital components to ensure a sustained commitment to market development. These efforts are essential to attract more buyers, especially those concerned about greenwashing, and to build a robust ecosystem that promotes high-impact investments.

## 4. Building Understanding of Buying Outcomes:

Targeted strategies are needed to support potential outcome buyers in understanding and purchasing SDG outcomes, particularly beyond the voluntary carbon market. Establishing standard definitions and metrics for different outcomes is pivotal in this regard. By focusing on building understanding and capacity in this space, stakeholders can drive more commitments from new outcome buyers, thereby expanding the market for SDG impact investments.

## 5. Standardizing and Measuring Outcomes

Strengthening capacity to define, measure, and verify outcomes, especially SDG outcomes, is crucial to advance outcome-based approaches. This involves standardizing metrics, improving measurement and verification processes, and enhancing the attribution of longer-term outcomes to program outputs. Partnering with relevant industry bodies and supporting pioneers of cost-effective verification approaches accelerates the development of standardized measurement frameworks. Focusing initial efforts on a small subset of outcomes, such as health or gender outcomes, will help to build momentum and increase interest among outcome buyers, particularly those motivated by impact in specific thematic areas.

As noted, investment required to meet the SDGs by 2030 is lagging well behind required levels, but outcome-based finance offers a way to address this pressing challenge. However, a wide range of improvements are needed to maximize the impact of outcome-based finance, including changes to market architecture, revenue splits, monitoring, reporting, and verification, and more. It is hoped that the findings and recommendations in this publication provide outcome sellers, buyers, verifiers, and all stakeholders in this space with information and motivation to scale the delivery of social and climate impact in emerging markets and beyond.



Photo credit: iStock poco\_bw, 2006809530

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## About Social Finance

Social Finance UK is a not-for-profit organisation that partners with governments, service providers, the voluntary sector and the financial community. Social Finance's international team delivers sustainable impact through outcomes-based approaches, innovative finance and cross-sector partnerships. Working with governments, funders and service providers, Social Finance develops new solutions to development challenges and build the market for change globally. Social Finance works with our partners to design, structure and deliver adaptive programmes that accelerate progress towards the UN Sustainable Development Goals. Social Finance works across a wide range of low- and middle-income countries, including in Africa, Latin America and the Caribbean, the Middle East, and East and Central Asia.

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# VIII. Appendix

**Table 3: Attributing Outcomes in Clean Cooking, Distributed Renewable Energy, and Small-Scale Agribusiness to SDGs**

SDG	Potential outcomes and outcome proxies	Example of use	Timing of verification and/or how to measure outcomes	Assessment of whether impact can be attributed to the activity
<b>Clean Cooking Outcomes</b>				
<b>SDG 3: Good Health and Well-being</b>	Reduction in particulate matter exposure (PM <sub>2.5</sub> ) ADALYs	Clean Impact Bond  World Bank ESMAP and Ci-Dev study on biogas technologies in rural Kenya	Improvements in ADALYs calculated by measuring personal exposure to PM <sub>2.5</sub> over 48 hours	<p>The negative health effects of traditional biomass cookstoves are well documented with close to 3.2 million deaths worldwide due to household air pollution (<a href="#">WHO 2023</a>).</p> <p>In a World Bank study in rural Kenya, personal exposure to particulate matter decreased linearly according to the fuel-use behavior of the primary cooks who adopted use of biodigester systems (<a href="#">ESMAP 2023</a>).</p> <p>Though Jeuland and Pattanayak find insufficient evidence of the impact of cookstoves on asthma, lung cancer, and cardiovascular diseases, they do observe a reduction in morbidity and mortality due to acute respiratory illnesses with the adoption of cleaner cooking technologies.</p> <p>Another study notes that self-reported respiratory symptoms and chest infections diminished significantly for cookstove adopters in Uganda and Kyrgyzstan after 12 months of use (<a href="#">FMO 2021</a>).</p> <p>Higher-tier, more efficient stoves are required to realize the full health and gender impacts of clean cooking (<a href="#">Gill-Wiehl &amp; Kammen 2022</a>).</p> <p>Projects with lower-tier stoves do not deliver similar levels of health and gender outcomes, given the higher volume of PM<sub>2.5</sub> produced (<a href="#">WHO 2021</a>).</p>

<p><b>SDG 5: Gender Equality</b></p>	<p>Time used and productivity benefits for women</p> <p>Decrease in prevalence of gender-based violence</p>	<p>Clean Impact Bond (# hours of 'Quality Time' added for women and girls)</p> <p>World Bank ESMAP and Ci-Dev study on biogas technologies in rural Kenya</p> <p>Em-POWERment framework (in development)</p>	<p>Quality Time calculated using household survey data across two project implementation phases</p>	<p>The Clean Impact Bond found that female cooks in households using biogas spent an average of 99 fewer minutes per day on cooking and fuel-related activities. The female cooks in the biogas-using households gained an additional 47 minutes of Quality Time per day, amounting to 285 hours, or about 12 days, per year.</p> <p>In a World Bank study in rural Kenya, biogas use was associated with significant time savings and drudgery reductions for female primary cooks, although the impacts on gender empowerment need further definition (ESMAP 2023).</p> <p>There are anecdotal reports from refugee camps in Kenya, Northern Uganda, Darfur, Ethiopia, Rwanda, Democratic Republic of Congo, Chad, Liberia, and Tanzania of sexual attacks on women while collecting firewood, but there is limited empirical evidence supporting these claims. Reports of sexual violence during firewood collection have also been noted in South Asia but are less well studied (ESMAP 2015).</p>
<p><b>SDG 13: Climate Action</b></p>	<p>Carbon credits</p>	<p>Widespread sale in the voluntary carbon market. Issuances totaled 279Mt in 2022.</p>	<p>Annual verification is done in line with commitments made in project design documents, certified by carbon standards</p> <p>Reduction in GHG emissions requires sustained product usage</p>	<p>Carbon standards bodies have approved methodologies to link product usage and greenhouse gas emissions reductions. This is most commonly assessed through annual in-person surveys to verify project roll-out, as per project design documents. Sustained use of the products is part of this.</p> <p>Digital measurement, reporting, and verification technologies have emerged to support remote monitoring of product usage. These are useful in enterprises operating PAYGo business models or when to verify carbon credit issuance.</p>
<p><b>SDG 13: Climate Action</b></p>	<p>Reducing direct emissions, including black carbon</p> <p>Avoiding emissions from forest degradation and supporting regeneration or reforestation</p> <p>Reducing threats to biodiversity</p>	<p>World Bank ESMAP and Ci-Dev study on biogas technologies in rural Kenya</p> <p>Clean Cooking Fund Rwanda: Rwanda Energy Access and Quality Improvement Project (payment linked to number of stoves sold)</p>	<p>Reductions in black carbon, carbon emissions, and reduced threats to biodiversity require sustained product usage and sustained shifts in household behaviors</p>	<p>Black carbon may be responsible for close to 20 percent of the planet's warming (World Bank 2020), and household energy is the single largest controllable source of black carbon globally (EPA 2023). However, claims about black carbon cooking impacts must be interpreted with caution (ESMAP 2015).</p> <p>A World Bank study in rural Kenya found biogas emitted considerably less black carbon compared to wood, resulting in substantial mitigation potential (ESMAP 2023). However, the scale and severity of environmental impacts of traditional biomass cooking vary greatly across geographies (ESMAP 2015).</p> <p>Biomass cooking is a factor contributing to forest degradation and localized deforestation, though the precise extent of these effects is debatable (ESMAP 2015).</p> <p>Firewood collection, specifically cases of excessive wood foraging, can lead to soil nutrient depletion, the loss of flora and fauna biodiversity, and accelerated soil erosion (Kissinger et al. 2012). Charcoal production can also reduce tree species biodiversity and reduce fauna diversity and abundance (ESMAP 2015).</p>

SDG	Potential outcomes and outcome proxies	Example of use	Timing of verification and/or how to measure outcomes	Assessment of whether impact can be attributed to the activity
<b>Distributed Renewable Energy (DRE)</b>				
<b>SDG 3: Good Health and Well-being</b>	<p>ADALYs</p> <p>Decreased under-5 mortality</p> <p>Increased immunization rates</p> <p>Increased safety as a result of switching away from fuels such as kerosene</p>	<p>VidaGas's supply of liquid petroleum gas to health clinics in Northern Mozambique</p>	<p>ADALYs can be calculated by measuring personal exposure to PM2.5 over 48 hours as per the standard ADALY calculation methodology</p>	<p>Evidence suggests that indoor air pollution attributable to household energy use for cooking, lighting, and heating contributes to approximately 3.2 million deaths worldwide (<a href="#">WHO 2022</a>).</p> <p>At a macro level, research suggests strong links between energy consumption in Africa and mortality and life expectancy of children under five years of age (<a href="#">IZA 2016</a>).</p> <p>In northern Mozambique, VidaGas's supply of LPG to health clinics contributed to a 36 percent increase in the number of children immunized in participating districts (<a href="#">SEAR 2017</a>).</p>
<b>SDG 4: Quality Education</b>	<p>Completion of primary education, extended studying hours, enhanced staff retention and teacher training (<a href="#">SEforAll 2019</a>)</p> <p>Improved knowledge through access to media / smart classrooms</p>	<p>Electrification in rural Brazil</p>	<p>Changes in education outcomes would require energy to be used in education settings first, then subsequently measured</p>	<p>Potential outcomes are generally not education outcomes themselves, but rather results that may facilitate education outcomes. This means willingness to pay for an education outcome linked to energy access is likely low.</p> <p>In Brazil, the electrification experience shows that girls in rural areas with access to electricity are 59 percent more likely to complete primary education by the time they are 18 years old than those without (<a href="#">Deloitte 2014</a>). In Bangladesh, women's literacy was found to be more than 20 percent higher in electrified households (<a href="#">Barkat et al. 2002</a>)</p> <p>Some links have been found between access to electricity and education attainment in BRICS countries but this varies between studies (<a href="#">Akram 2022</a>).</p> <p>The co-benefit of education resulting from energy access has not been extensively explored.</p>

<p><b>SDG 5: Gender Equality</b></p>	<p>Time used and productivity benefits for women</p> <p>Better safety of women and girls from street lighting that enables participation in night schools and community activities (Terrapon-Pfaff et al. 201)</p>	<p>Electrified water-pumping in Zanzibar</p>	<p>Quality Time calculated using household survey data</p>	<p>Gender equity is connected to modern energy services in many ways, but quantitative empirical work on these connections is limited. Researchers find a positive association between the women's empowerment index and energy access variables, though this household pattern does not hold across all countries and contexts (Chandrasekaran et al. 2023).</p> <p>In Zanzibar, electrified water-pumping to central locations in villages helped women save three hours a day (Winther 2008, SEAR 2017).</p>
<p><b>SDG 7: Affordable and Clean Energy</b></p>	<p>Access to clean and affordable energy (kWh)</p> <p>Use of clean energy</p>	<p>Distributed renewable energy</p> <p>Remote monitoring of clean energy usage in PAYGO models</p>	<p>To be determined</p> <p>Verification done immediately using remote monitoring technology</p>	<p>Verification could potentially be conducted on an emerging D-REC technology platform, which uses an algorithm to automatically determine if claims are accurate (Positive Capital Partners 2021-22).</p> <p>Digital technologies have emerged to support remote monitoring of product usage, particularly for enterprises operating PAYGO business models.</p>
<p><b>SDG 8: Decent Work and Economic Growth</b></p>	<p>Job creation</p> <p>Increased income</p> <p>Lower expenditure on traditional fuel sources such as kerosene</p> <p>Agricultural productivity</p>	<p>N/A</p>	<p>Changes in livelihood outcomes would require energy to be used in a productive manner first, then subsequently measured</p>	<p>Researchers struggle to understand the direct causal link between economic growth and energy access, but it is assumed that there is no route to development without greater energy consumption (World Bank 2022).</p>
<p><b>SDG 13: Climate Action</b></p>	<p>Carbon credits</p> <p>Reducing direct emissions, including black carbon</p> <p>Avoiding emissions from forest degradation and supporting regeneration and reforestation</p> <p>Reducing threats to biodiversity</p>	<p>Widespread sale of carbon credits in the voluntary carbon market, with issuance totaling 279Mt in 2022</p> <p>Sale of 'small scale renewable energy' credits in the voluntary carbon market</p>	<p>Annual verification is done in line with commitments made in project design documents, certified by carbon standards</p> <p>Reductions in black carbon and reduced biodiversity threats requires sustained usage</p>	<p>The replacement of conventional hydrocarbon-based fossil fuels for electricity production by distributed renewable energy technologies can reduce greenhouse gas emissions.</p> <p>In Pakistan, two cases studies showed that distributed renewable energy solutions are helpful in reducing deforestation, as communities become less reliant on wood for fuel (Ahmad et al. 2022).</p> <p>Recent studies have also linked long-term access to distributed renewable energy solutions to climate resilience and adaptive capacity, decreasing vulnerability to climate change risks (IRENA 2021). Adaptation benefits have yet to be quantified or sold as outcomes in the distributed renewable energy sector.</p>

SDG	Potential outcomes and outcome proxies	Example of use	Timing of verification and/or how to measure outcomes	Assessment of whether impact can be attributed to the activity
<b>Small-Scale Agribusiness</b>				
<b>SDG 2: Zero Hunger</b>	<p>Increased food yield</p> <p>Greater productivity, availability, and affordability</p>	<p>Better Life Farming Alliance (BLFA) and IFC support via Women in Agribusiness Value Chains project</p> <p>Market-oriented vegetable production in Northern Ethiopia</p>	<p>Productivity and profit increase at the farm-level</p> <p>Food and nutrition measured at the level of consumers of agribusiness outputs</p>	<p>IFC found that reported farm yields among participants of Rubi's farm increased by 25 percent (<a href="#">IFC 2019</a>).</p> <p>Agricultural interventions seeking to improve smallholder incomes can have negative impacts on food and nutrition security. For example, efforts to promote market-oriented vegetable production in Northern Ethiopia successfully increased incomes, but lowered food variety and decreased diet diversity (<a href="#">Gebru et al. 2019</a>).</p>
<b>SDG 5: Gender Equality</b>	<p>Increased income for women</p>	<p>BLFA and IFC support via Women in Agribusiness Value Chains project</p>	<p>Gender and livelihood outcomes for women would be measured at the level of smallholder farmers, after they receive support services</p>	<p>There are only a few empirical studies on the welfare or income impacts of contract farming on smallholders, including women. These have not yielded consistent results (<a href="#">Khalfan 2012</a>).</p>

<p><b>SDG 8: Decent Work and Economic Growth</b></p>	<p>Job creation Increased income</p>	<p>BLFA and IFC support via Women in Agribusiness Value Chains project</p>	<p>Livelihood outcomes would be measured at the level of smallholder farmers, after they receive support services</p>	<p>Individual anecdotes as a result of the support from BLFA and IFC, e.g. "farmers have been able to increase their income by 10-15 percent" (<a href="#">IFC 2019</a>).</p> <p>Productive alliances can lead to increases smallholder farmer incomes (<a href="#">IFC 2019</a>).</p> <p>Inclusive agribusiness through various contract farming approaches is often reported to yield positive income effects (<a href="#">Guus Van Westen et al. 2019</a>).</p> <p>Tracking job creation and changes in smallholder income are the easiest outcomes to verify.</p>
<p><b>SDG 13: Climate Action</b></p>	<p>Carbon credits Reduced threats to biodiversity Improved soil fertility</p>	<p>Widespread sale of carbon credits in the voluntary carbon market, with issuances totaling 279Mt in 2022</p>	<p>Annual verification in line with commitments made in project design documents, certified by carbon standards</p> <p>Reduction in GHG emissions requires changes in agricultural practices</p> <p>Reducing threats to biodiversity requires changes in agricultural practices</p>	<p>Similar evidence on carbon credits from clean cooking and distributed renewable energy can be used.</p>

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