



A CALL TO ACTION

DELIVERING RESPONSIBLE CARBON FINANCE

ACKNOWLEDGEMENTS

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ABBREVIATIONS

ACMI	Africa Carbon Markets Initiative
ADALYs	Averted Disability Adjusted Life Years
CCA	Clean Cooking Alliance
CCT	Controlled Cooking Test
CDM	Clean Development Mechanism
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
4C	Clean Cooking and Climate Consortium
FPIC	Free, prior, and informed consent
fNRB	Fraction of Non-Renewable biomass
GGGI	Global Green Growth Institute
ICROA	International Carbon Reduction and Offset Alliance
ICVCM	Integrity Council for the Voluntary Carbon Market
ITMO	Internationally transferred mitigation outcome
KPT	Kitchen Performance Test
LPG	Liquified petroleum gas
MCFA	Modern Cooking Facility for Africa
MECS	Modern Energy Cooking Services
MRV	Monitoring, reporting, and verification
NDC	Nationally determined contribution
ODA	Official development assistance
OTC	Over the counter
RBF	Results-based financing
SBTi	Science Based Targets initiative
SDG	Sustainable Development Goal
SD VSta	Sustainable Development Verified Impact Standard
SEC	Securities and Exchange Commission
SIDS	Small Island Developing States
TPDDTEC	Technologies and Practices to Displace Decentralized Thermal Energy Consumption
TSVCM	Taskforce on Scaling Voluntary Carbon Markets
UNFCCC	United Nations Framework Convention on Climate Change
VCM	Voluntary carbon market
VCMi	Voluntary Carbon Markets Integrity Initiative
VCS	Verified Carbon Standard
WBT	Water Boiling Test
WOCAN	Women Organizing for Change in Agriculture and Natural Resource Management

GLOSSARY

TERM	DEFINITION	TERM	DEFINITION
Baseline emissions	The greenhouse gas emissions that would occur in the baseline scenario.	Kitchen performance test	KPTs are real-world assessments of normal daily fuel consumption in homes, where all fuel types in a home are weighed over repeated days.
Carbon credit	Tradeable unit representing 1 tonne of carbon dioxide equivalent (CO ₂ e) avoided or removed from Earth's atmosphere.	Leakage	Net change of anthropogenic emissions by sources and/or removals by sinks of greenhouse gases that occurs outside the project boundary and that could be measurable and attributable to the project. In the context of clean and improved cooking carbon projects, leakage refers to situations where the adoption of cleaner cooking technologies in one area leads to unintended negative environmental impacts (e.g., increase of GHG emissions) elsewhere.
Clean cooking	Cooking solutions that achieve ISO Tier 4 or 5 for PM2.5 emissions and Tier 5 for carbon monoxide emissions. These generally include solar, electric, liquefied petroleum gas (LPG), biogas, ethanol, and some processed biomass/pellet stoves.	Over-crediting	The risk that the project has issued credits in excess of what is justifiable against the business-as-usual scenario.
Data loggers	Devices installed in households to collect physical data such as temperature, heat flux, electrical current, motion, or pollutant concentrations. Stove use monitors (SUMs) use one or more of these measurements to estimate stove use and/or energy consumption.	Project emissions	Emissions associated with ongoing operations of the carbon credit project.
Fraction of non-renewable biomass (fNRB)	The portion of wood fuel used in a carbon project that is unsustainable and contributes to long-term loss of biomass carbon stocks. ¹ The fNRB is a critical input into the emission reduction calculation of clean and improved cooking carbon projects as the amount of fuel used before and during the project is multiplied by this share to estimate net changes in emissions.	Rebound effect	An increase in the cookstove efficiency may lead to increased demand and therefore lower energy savings than would be expected by simply considering the change in energy efficiency and the baseline energy use prior to the distribution of the clean(er) technology.
Fuel use before the project	Clean and improved cooking activities need to establish a baseline that reflects the amount and mix of fuels used for cooking before the project is implemented. The pre-project fuel use therefore determines which types of fuels are used for cooking and in what quantities before the project started.	Water Boiling Test (WBT)	Laboratory-based test that can be used to measure how efficiently a stove uses fuel to heat water in a cooking pot and the quantity of emissions produced while cooking. The WBT was the basis for the IWA 11:2012, a precursor to the ISO 19867-1 international voluntary performance standard.
Fuel use during the project	The amount(s) and type(s) of baseline and project fuel(s) used during the project's operation. This occurs either when the same fuel used before the start of the project is more efficiently burned in an improved cookstove or when another device is used alongside the project device (i.e., "stove stacking"). Fuel used in the project device can also include the use of project fuels (e.g., a project may switch away from wood fuel to pellets, biogas, or ethanol).	Wood-to-charcoal conversion factor	Expresses the amount of firewood that is needed to produce a kilogram of charcoal. To establish this parameter, project developers can apply a CDM default value, determine a regional value based on a sample test of kilns, or use a country- or region-specific value or standardized baseline. This conversion factor is relevant only for projects that use charcoal in the baseline or project scenario(s).
Improved cooking	Cooking solutions that burn fuel more efficiently than in the baseline. This includes improved efficiency wood and charcoal stoves. An improved cooking solution can burn wood fuel and/or charcoal more efficiently without being cleaner.		



A man sells an ethanol stove and fuel.
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CONTENTS

EXECUTIVE SUMMARY

MARKET SNAPSHOT

PART ONE

Why carbon finance must be delivered responsibly **15**

Objective of this report **16**

Structure of this report **16**

PART TWO

The Principles for Responsible Carbon Finance in Clean Cooking **19**

Integrity **22**

I1: Baselines are realistic, up-to-date, and geography-specific. Any assumptions made are transparent and substantiated **22**

I2: Fuel consumption or stove usage are accurately monitored. Any assumptions made are transparent and substantiated **22**

I3: Only sustainable development benefits that are substantiated and can be evidenced are claimed **23**

Transparency **24**

T1: The monetary and/or non-monetary benefits reaching the project and technology/fuel users are transparent within a given transaction **24**

Fairness **25**

F1: Informed consent precedes each user's participation in a carbon project **25**

F2: Carbon revenues are shared by all stakeholders in a way that is proportionate to the risk they assume and the value they create **25**

Sustainability **27**

S1: Carbon finance, official development assistance and philanthropic capital are complementary **27**

S2: The positive effects of carbon finance on clean and improved cooking markets are promoted, while excessive market distortions are avoided **27**

S3: National policies facilitate the development of clean and improved cooking carbon markets. **28**

PART THREE

Rationale for development of the Principles **30**

Integrity **30**

Quantifying climate impact **31**

Ensuring sustainable development benefit claims materialize **40**

Improving the monitoring of sustainable development benefits **40**

Transparency **42**

Ensuring transparency in monetary and non-monetary benefits shared **42**

Fairness **44**

Ensuring fair processes in project participation **45**

Ensuring fair risk-reward revenue and benefit sharing **46**

Sustainability	50
Ensuring carbon finance and other sources of funding are complementary and avoid excessive market distortions	50
Promoting regulatory clarity to deliver an enabling environment for investments in the carbon market	52
PART FOUR	
Looking ahead	56
ANNEX 1	
Definition of market actors	58
ANNEX 2	
Principles' Key Actions	61
Integrity	61
I1: Baselines are realistic, up-to-date, and geography-specific. Any assumptions made are transparent and substantiated	61
I2: Fuel consumption or stove usage are accurately monitored. Any assumptions made are transparent and substantiated	62
I3: Only sustainable development benefits that are substantiated and can be evidenced are claimed	62
Transparency	63
T1: The monetary and/or non-monetary benefits reaching the project and technology/fuel users are transparent within a given transaction	63
Fairness	64
F1: Informed consent precedes each user's participation in a carbon project	64
F2: Carbon revenues are shared by all stakeholders in a way that is proportionate to the risk they assume and the value they create	64
Sustainability	65
S1: Carbon finance, official development assistance and philanthropic capital are complementary	65
S2: The positive effects of carbon finance on clean and improved cooking markets are promoted, while excessive market distortions are avoided	65
S3: National policies facilitate the development of clean and improved cooking carbon markets.	66
REFERENCES	

EXECUTIVE SUMMARY

SECURING INVESTMENT TO SCALE

Carbon markets offer an important avenue to attract private finance into clean cooking. The clean cooking sector requires investment at scale to achieve universal access to clean cooking by 2030. Despite rising investor interest in the sector, existing finance flows are nowhere near to closing the investment gap, and 2.3 billion people still lack access to clean energy cooking solutions. Carbon markets offer an important avenue to attract finance into clean and improved cooking companies by facilitating the flow of finance into markets considered too high-risk for commercial lenders. The promise of carbon revenues can also help to attract commercial capital needed to get projects up-and-running, and once delivered can further bolster investor confidence to support programs demonstrating proof-of-concept. Since carbon finance is results-based and only delivered when the improved cooking technologies are used, it also incentivizes programs to build in attention to customer care and retention, thus building the foundation for sustained growth in the underlying demand for clean cooking solutions.

However, the continued flow of carbon finance to clean cooking is not guaranteed. The last couple of years have seen carbon markets undergo a significant evolution. This has seen the market shift to a preference for removals over avoidance credits, resulting primarily from net zero guidance under the Science Based Targets initiative (SBTi). SBTi recently opened the door for other project types through its Beyond Value Chain Mitigation (BVCM) guidance, but it remains to be seen how many companies will choose to engage in BVCM. In addition, delays in agreeing on operationalizing Article 6 of the Paris Agreement has resulted in uncertainty on carbon crediting approaches under the United Nations Framework Convention on Climate Change (UNFCCC), and what this might mean for the voluntary carbon market. And several initiatives have emerged seeking to drive higher environmental integrity. This increased scrutiny of carbon markets has resulted in significant improvements – many of which are ongoing – but some buyers of carbon credits are now choosing to refrain from participating.

These changing global carbon market dynamics are affecting clean and improved cooking. The clean and improved cooking sector is vulnerable to changes in market dynamics at the global level due to its reliance on carbon finance. The latest Industry Snapshot published by the Clean Cooking Alliance found that, in 2022, enterprises with active or planned carbon activities accounted for 88% of total revenue and 57% of total investment. Historically, most demand for clean cooking carbon credits has come from companies that are voluntarily seeking to compensate for their emissions as part of their climate strategy (i.e. their emissions are not regulated). Therefore, ongoing demand for clean cooking carbon credits depends on the reputational benefits that engaging in carbon markets offers to carbon credit buyers. When perceived risks outweigh the benefits, investors and buyers will step back.

Several critical issues risk inhibiting the sustained growth of carbon finance into clean and improved cooking. The first of these is concerns over the climate integrity of carbon credits generated by clean and improved cooking carbon projects. As carbon credits are commonly used to compensate for emissions occurring elsewhere, it is essential to get the emissions accounting right. In addition, buyers frequently pay a premium for the non-carbon benefits that projects deliver, so ensuring that these claimed sustainable development benefits materialize from projects is important. Secondly, transparency in carbon markets is essential to ensuring the fair distribution of benefits among actors. Thirdly, generating carbon credits from clean and improved cooking carbon projects also raises ethical considerations regarding the inclusion of households in the development of projects and the distribution of benefits across the value chain from households through to the final carbon credit end buyer. And finally, ensuring complementarity between carbon markets and other forms of funding, such as official development assistance and philanthropic capital, should avoid excessive market distortions and ensure the long-term growth of local clean and improved cooking markets. This report explores the relevance of these issues for the clean and improved cooking sector and summarizes key ongoing efforts to address these issues.

STEPPING UP RESPONSIBILITY

A coordinated strategy is needed to ensure that clean and improved cooking activities certified in the carbon market deliver the high-quality carbon credits that buyers expect. To this end, this report offers a set of Principles that serve to guide responsible conduct in the carbon markets, help build the underlying conditions of trust and confidence needed for this market to flourish, and give buyers confidence in the quality of the programs in which they invest. These Principles aim to establish a market that operates with four values at its heart:

- **Integrity:** Project claims are evidence-based, case-specific, and substantiated.
- **Transparency:** Noncommercially sensitive information on carbon markets is accessible.
- **Fairness:** Clean and improved cooking carbon projects solicit informed consent from users and share revenue fairly along the clean and improved cooking value chain.
- **Sustainability:** Carbon markets complement other forms of funding and do no long-term harm to local clean and improved cooking markets.

The Principles outlined in Figure 1 offer a comprehensive set of guidelines that ensure that clean cooking carbon markets live up to these values.

Unlike any other initiative in the carbon market, the Principles are specific to clean and improved cooking and are the product of a sector-driven initiative. The Principles were developed through a series of consultations with dedicated working groups consisting of over 530 stakeholders from across clean and improved cooking markets. These include a diverse range of stakeholders representing project developers; investors; climate financiers; carbon standards; nongovernmental organizations; market facilitators; service providers; and carbon credit buyers, sellers,

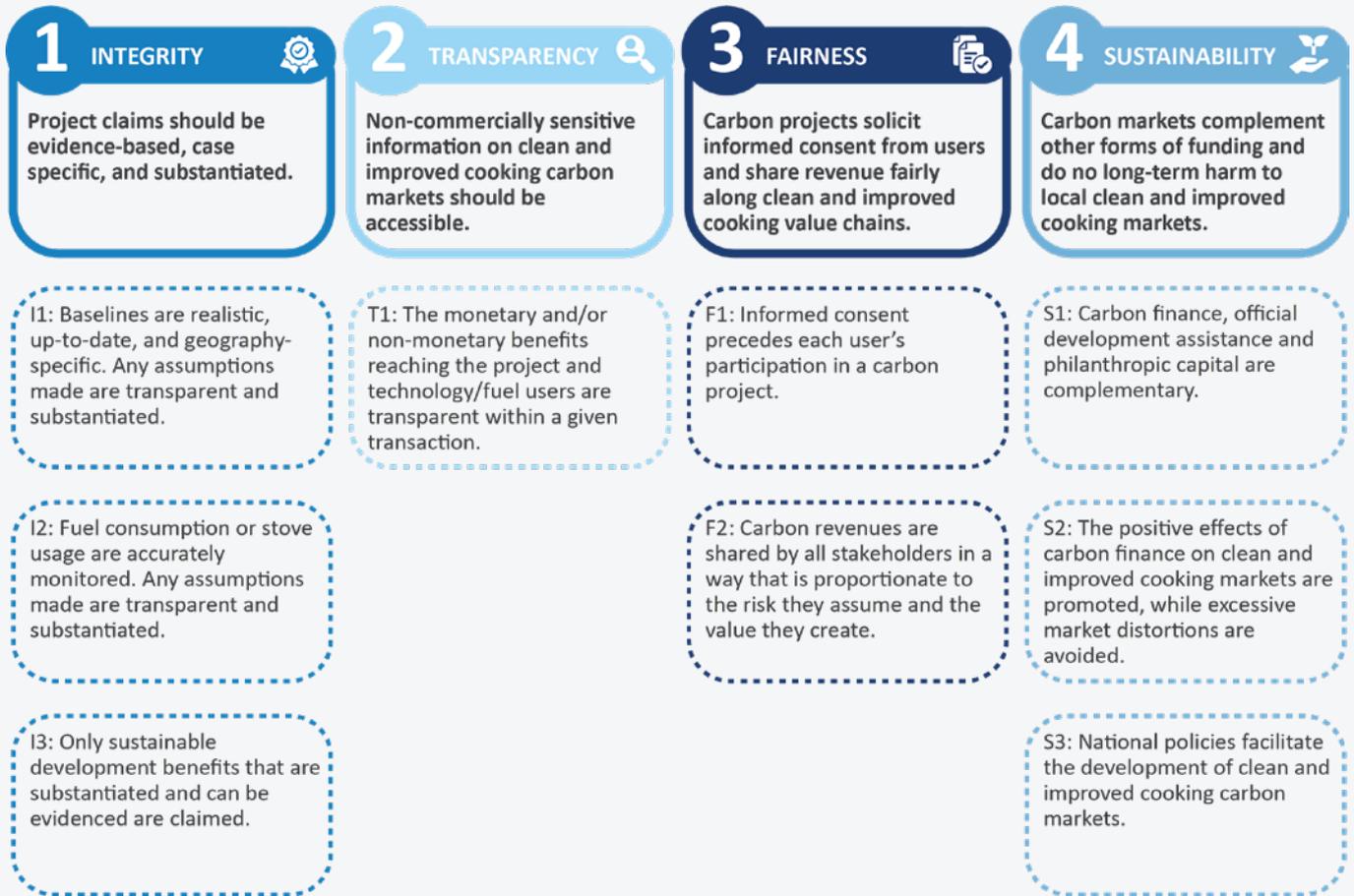
and intermediaries. The analysis is complemented by 25 expert interviews, desk-based research, and several surveys sent to working group members. The Principles also underwent public stakeholder consultation, followed by a review by the Responsible Carbon Finance Advisory Council.

The Principles are designed to complement existing action — filling gaps where they exist and raising ambition where it is lacking. They do not aim to replace other valuable initiatives working on quality issues in the broader carbon markets, rather, they are designed to build on them with details that are specific to the clean and improved cooking sector and too granular for broader initiatives to cover. The Principles provide additional guidance to address the unique challenges and opportunities faced by stakeholders in the market.

The Principles are intended to be ambitious, yet pragmatic; teeing up a course of action for market actors to drive improvements in the short term. They are intended as aspirational guideposts that outline how to work towards quality carbon credits that are delivered responsibly and sustainably from the clean and improved cooking sector.

Looking ahead, the Principles will be operationalized through a Code of Conduct outlining best-practice examples for their implementation. The Principles introduced in this report aim to address real risks that stand to limit the growth of carbon finance in the clean and improved cooking sector. They provide a first step toward the development of a voluntary Code of Conduct that will set out the essential elements of high-quality carbon financing in the sector. The Code of Conduct will be voluntary, at least certainly to begin with, as there are no obvious existing enforcement structures that could regulate adherence to the Code of Conduct. The Code of Conduct will present best-practice examples for how to operationalize the Principles, with a focus on project developers as the key decision-makers as to how projects are designed and implemented.

FIGURE 1
The Principles for delivering responsible carbon finance in clean cooking



DELIVERING REAL IMPACT

The clean and improved cooking sector can deliver real impact. While the Principles provide the guideposts for doing so, there are several initiatives underway that will impact clean and improved cooking carbon projects.

General efforts, outside of — but having an impact on — the clean and improved cooking sector include:

- **Delivering climate change mitigation.** Efforts that promote and safeguard the climate integrity of carbon markets are critical to ensure that the sector remains attractive to investors, allowing the market to scale responsibly. Ongoing efforts

to do so include revising and developing new carbon accounting methodologies based on the latest science and market experience to allow more reliable and accurate emission reduction quantification, financing research to reduce uncertainties of key parameters, and further developing technological solutions that more accurately capture clean cookstove performance in real-time. Outside of clean and improved cooking markets, the Integrity Council for the Voluntary Carbon Market (ICVCM) has set the bar for carbon crediting programs and their methodologies to qualify as high quality. In addition, several carbon credit rating agencies have been established to address the absence of standardized information for buyers.

- **Delivering on the Sustainable Development Goals.**

Clean and improved cooking carbon projects offer significant positive contributions to the Sustainable Development Goals (SDGs). Improved transparency around the depth and durability of delivering against the SDGs will help to ensure that carbon credits from clean and improved cooking carbon projects attract carbon prices that are commensurate with the carbon and non-carbon benefits they deliver. Some carbon credit rating agencies now provide comparative project evaluation of the SDG contributions that projects claim.

- **Ensuring transparency in financial flows.** Limited information on carbon prices and revenue distribution makes it difficult for carbon credit buyers to know whether they are paying a fair price. Greater transparency in how revenue is used would increase investor confidence in all projects, including in clean and improved cooking carbon projects. The ICVCM is also considering requirements to communicate how carbon revenue is used and managed for the purpose of benefit sharing. To provide more transparency on carbon pricing, several exchange platforms have established standardized contracts whose prices are fully disclosed, including for clean and improved cooking carbon credits.

Efforts specific to the clean and improved cooking sector include:

- **Fairly engaging with communities and sharing benefits.** Meaningful involvement of technology users and the communities in which they reside can lead to more successful and sustainable projects. Carbon standards require projects to conduct local stakeholder consultations, with the Gold Standard providing extensive guidelines for doing so. Several projects are exploring ways to increase benefit sharing with technology users and their communities, including pay-per-use approaches that incentivize continued clean cookstove use, establishing manufacturing facilities in host

countries, or setting up a fund for community support. Some projects have committed to sharing a portion of carbon revenue with households using clean and improved cooking technologies, and/or provide information on how carbon revenue is used in their projects.

- **Delivering sustainable market growth.** While carbon finance is an important source of support to clean and improved cooking carbon projects and is essential in attracting private finance, it alone is not sufficient to achieve the scale necessary to provide clean and improved cooking solutions to the billions of people who lack access. Carbon finance must be leveraged in harmony with other forms of funding to deliver sustainable growth of the clean and improved cooking sector. To ensure the complementarity of funding sources, some public funding agencies have started to include the option to scale down the contribution of public funding in instances where the needs of clean and improved companies are clearly being met through carbon financing alone.

There remains a way to go, but clean cooking is moving in the right direction. Improvement is needed to ensure buyer confidence in clean and improved cooking carbon projects. Methodological updates will likely result in lower volumes of carbon credits being issued to projects in the future. Tracking SDG contributions, fairly engaging with local communities, and sharing benefits will take time and effort.

Carbon financing can make the difference if buyers offer prices that are commensurate with the level of effort needed to generate high-quality credits. The evidence increasingly suggests that buyers are ready to commit larger allocations of funding to the most credible projects. This momentum should be used to instigate a concerted shift across the clean and improved cooking sector to secure the delivery of high-quality carbon credits and to enable the possibility of a world where carbon finance is used responsibly to bring better, healthier cooking to the billions of people currently living without it.

MARKET SNAPSHOT ^a

Clean cooking



Cooking solutions that achieve ISO Tier 4 or 5 for PM2.5 emissions and Tier 5 for carbon monoxide emissions. These generally include solar, electric, liquefied petroleum gas (LPG), biogas, ethanol, and some processed biomass/pellet stoves.

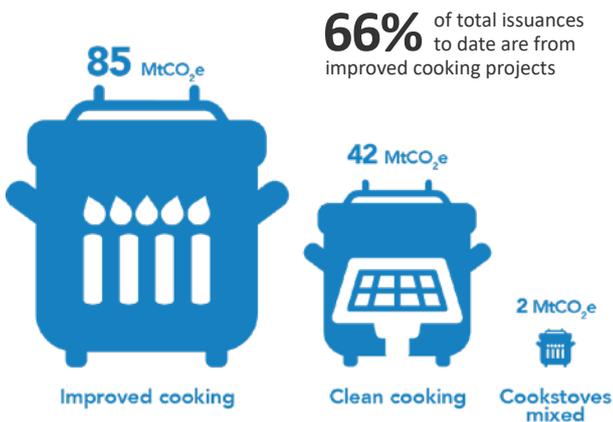
Improved cooking



Cooking solutions that burn fuel more efficiently than in the baseline. This includes improved efficiency wood and charcoal stoves. An improved cookstove can burn wood fuel and/or charcoal more efficiently without being cleaner.

Improved cooking projects dominate carbon credit supply

Market concentration is observed in the types of cooking technologies that are accessing the carbon market. There are nearly 400 projects registered (including Programmes of Activities and standalone projects). Less than one-third of these are clean cooking solutions (e.g., biogas, electric, ethanol, LPG, pellet stoves, solar). The historical dominance of improved cooking solutions over clean cooking alternatives can be explained by the (typically) lower cost of improved cookstoves, lower habitual and cultural barriers to switching technologies, and simpler business models due to the retention of the baseline fuel.



Carbon finance is essential for clean and improved cooking

Over the past decade, clean and improved cooking activities worldwide are estimated to have benefited from US\$ 225 – 530 million in aggregate carbon financing.^b

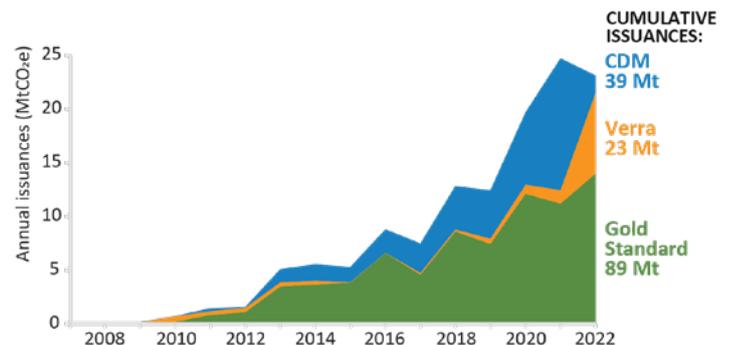
Two-thirds of the carbon revenue has been generated since 2020, triggered by a boom in demand for carbon credits and record-breaking issuances.

US\$ 60-140 million in carbon revenue is estimated to have reached the clean cooking sector in 2021



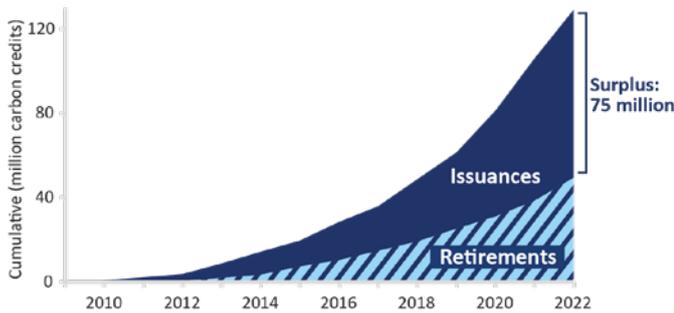
Two carbon standards lead supply of clean cooking carbon credits

The Gold Standard is the principal standard of choice for clean and improved cooking project developers, responsible for the issuance of nearly two-thirds of carbon credits on the market today. Verra’s Verified Carbon Standard follows next, with the standard certifying one-quarter of issuances. The remainder can be attributed to historical issuances under the Clean Development Mechanism (CDM) (which allows no post-2020 issuances).



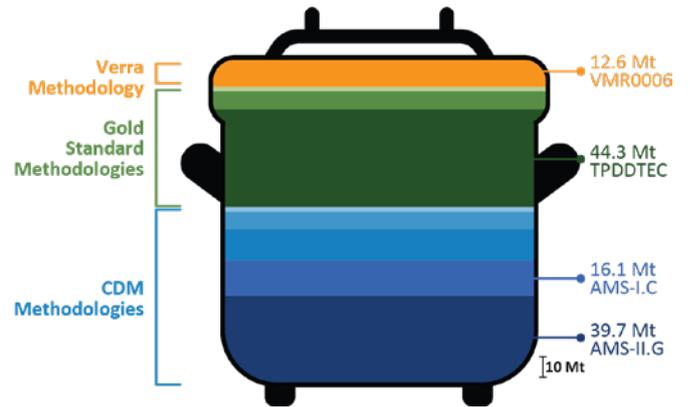
Issuances from clean and improved cooking projects have doubled since 2020

130 million carbon credits have been issued to clean and improved cooking activities. Buyers retired a record 12 million clean and improved cooking carbon credits in 2022. As of 2022, the surplus of clean cooking carbon credits was 75 million. Some of these will have been sourced by buyers for future use or onward trading and have not yet been retired.^c



The CDM leads greenhouse gas accounting approaches

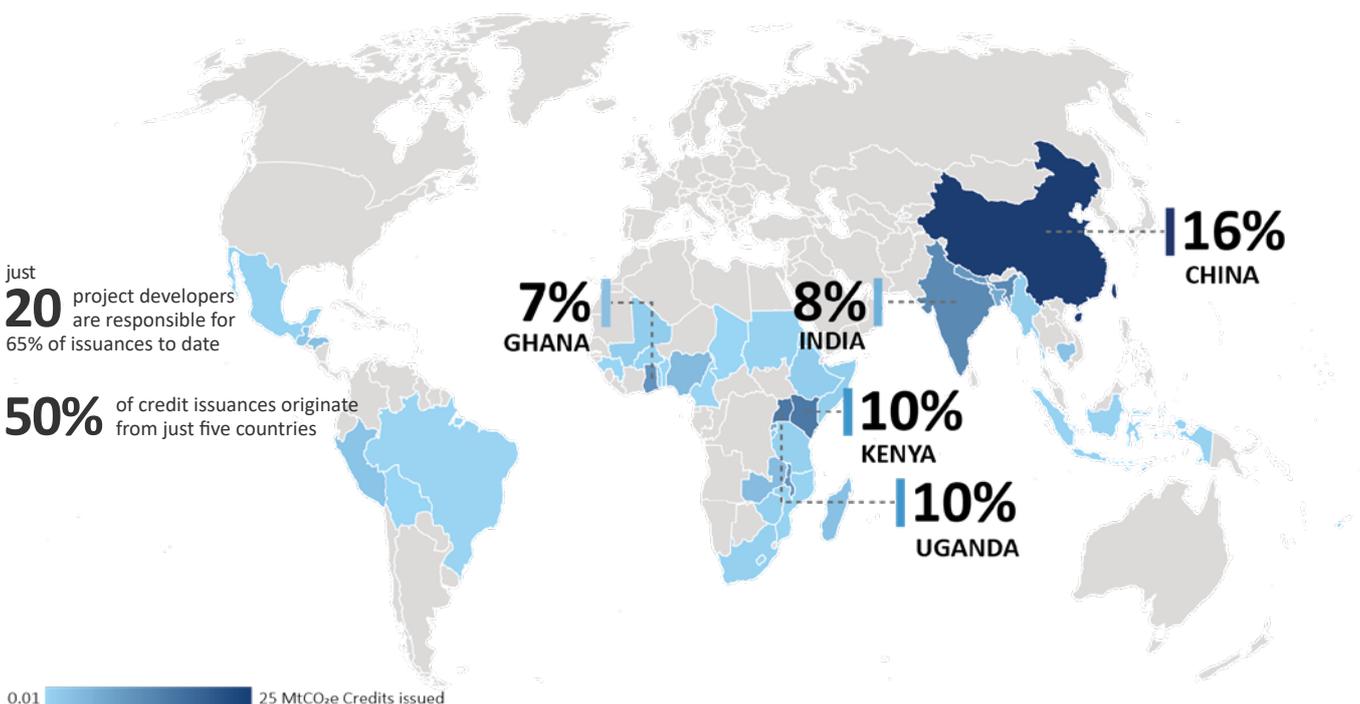
8 methodologies are primarily used to quantify greenhouse gas emission reductions from clean cooking projects. Each offer different quantification approaches and cater for different technologies. 54% of credits are quantified following a CDM methodology, 37% following a Gold Standard methodology and 8% following a Verra methodology.^d



A handful of countries dominate supply

Only five countries are responsible for half of carbon credit issuances. China, Uganda, Kenya, India and Ghana lead the way, hosting a diversified portfolio of clean and improved cooking activities.

38 COUNTRIES HOST CLEAN AND IMPROVED COOKING PROJECTS THAT HAVE ISSUED CARBON CREDITS



just **20** project developers are responsible for 65% of issuances to date

50% of credit issuances originate from just five countries

0.01 25 MtCO₂e Credits issued

Two women prepare a meal using a portable stove.

© Mauro Vombe /
Clean Cooking Alliance



PART ONE

Why carbon finance must be delivered responsibly

Carbon finance is an important source of finance for clean and improved cooking. In an industry where access to finance remains a leading barrier across the developing world, this results-based funding has played a critical role in enabling the clean and improved cooking market to scale. Over the past decade, clean and improved cooking activities worldwide are estimated to have generated US\$ 225 million to US\$ 530 million in aggregate carbon financing.² Research by the Clean Cooking Alliance (CCA) shows that between 2017 and 2022, clean and improved companies experienced a 45-fold increase in the volume of carbon finance secured.³ These growing financing flows provide some assurances for private investors that monetizing the positive impacts of clean and improved cooking can enable these markets to be served with commercially viable business models.

Future growth in demand for carbon credits hinges on clean and improved cooking carbon projects delivering carbon credit quality, as well as buyer confidence in their doing so. For the market to scale with integrity, carbon finance must be delivered responsibly, based on sound, up-to-date scientific data and realistic, verifiable assumptions. Transparency and fairness in the delivery of carbon finance are equally important, as is nurturing favorable investment environments that allow clean and improved cooking markets to scale sustainably. Carbon markets depend on the financial and reputational benefits they bestow on investors and carbon credit buyers. If the costs of engagement outweigh the benefits, carbon markets can quickly lose steam. Thus, efforts to build confidence in carbon financing models for the broader market and the clean and improved cooking sector specifically are essential not only for creating lasting positive climate impacts, but also for making progress toward achieving universal access to clean and improved cooking.

Achieving universal access to clean and improved cooking by 2030 will require carbon finance.

Investment in clean and improved companies remains far short of the US\$ 4.5 billion required to achieve universal access to clean and improved cooking by 2023.⁴ Technological affordability, traditional cooking habits and preferences, unclear or unfavorable regulatory/policy environments, and access to finance all act as barriers to commercialization.⁵ It is estimated that more than a quarter of the global population — 2.3 billion people — are still without access to clean and improved cooking solutions.⁶ Many rely on traditional cooking methods, including the use of firewood, charcoal, kerosene, and coal, which are associated with significant health and safety risks,⁷ as well as labor demands.

Clean and improved cooking carbon projects by nature represent the type of activity for which carbon markets were conceptualized to support: they provide direct benefits to individuals who truly need support, and they contribute to additional social benefits such as improving quality of life, gender equality, and human health and safety. Jeopardizing trust in these projects therefore not only risks forfeiting lasting positive climate impacts, but also carries implications for the socioeconomic conditions of vulnerable communities around the world.

Clean and improved cooking markets risk being disproportionately affected by changes in global carbon markets. The future growth potential of the carbon market is projected to be significant, driven by the need of both private businesses and governments to reach a global state of net zero by mid-century.⁸ While clean and improved cooking carbon projects historically represent a small portion of total issuances, in recent years the role of these projects has grown,

reaching nearly 10% of total issuances in the voluntary carbon market in 2022.⁹

The sector's growing dependence on carbon finance as a key revenue source means it could be disproportionately affected by changes in market dynamics at the global level. Average prices of cookstove carbon credits have depreciated since the start of 2022 because of worsening global economic conditions (triggered by rising inflation and tightening monetary policies) as well as mounting integrity concerns regarding the carbon market. Falling prices have in turn contributed to plateauing global issuance volumes of carbon credits, although the clean and improved cooking market has defied this general trend by issuing three times the volume of carbon credits during the first half of 2023 as in the same period last year.¹⁰

Several carbon market-wide initiatives are underway that seek to improve quality issues for carbon credits, but none specifically targets clean and improved cooking. With climate integrity concerns hampering short-term growth prospects, coordinated efforts are starting to emerge that seek to address quality concerns in the broader market. One example is the Integrity Council for the Voluntary Carbon Market (ICVCM), which has released criteria for assessing categories of credits and crediting methodologies, including the introduction of a (minimum) threshold standard for "high-quality carbon credits."¹¹ While such developments show promise, there is no guarantee that they will sufficiently address risks specific to clean and improved cooking carbon markets. Sector-specific risks must be identified, understood, and effectively tackled by actors who are best positioned to deliver the solutions. A consolidated effort is therefore needed to steer the development of a responsible carbon market for clean and improved cooking and to chart a road map to realizing this vision.

Objective of this report

The objective of this publication is to offer a set of Principles that can guide the responsible delivery of carbon finance to the clean and improved cooking sector and provide the analytical backbone for exploring the critical challenges that undermine the development of clean and improved cooking carbon markets. Responsible carbon finance for clean and improved cooking means developing a carbon market that operates with integrity, is transparent, and ensures

fairness and sustainability. The Principles set out the high-level aspirational guideposts for responsible conduct for all entities in the clean and improved cooking and carbon market ecosystem.

Structure of this report

The remainder of this report is structured into three distinct parts:

- **PART 2** presents the Principles in their entirety, including examples of actions that key market actors will need to take to achieve a given principle.
- **PART 3** provides the rationale for the Principles by investigating a series of critical concerns that risk inhibiting the sustained growth of carbon finance into the clean and improved cooking sector, namely:
 - **Integrity.** Concerns over the climate integrity of carbon credits generated by clean and improved cooking carbon projects risk that investors shy away from scaling their investments in clean and improved cooking carbon projects and buyers turn to other project types to meet their demand for credits. There is an urgent need to introduce more robust greenhouse gas accounting methods for clean and improved cooking and to (re)build confidence among buyers in the integrity of clean and improved cooking carbon credits and the nature of claims that can be made from their use. In addition, there is an opportunity to further strengthen sustainable development benefit reporting of clean and improved cooking carbon projects to better demonstrate their contribution to the Sustainable Development Goals (SDGs), an important and attractive characteristic of clean and improved cooking carbon projects.
 - **Transparency.** Transparency is a prerequisite for determining fairness of carbon markets for clean and improved cooking. Transparency can be strengthened by making noncompetitive information on carbon markets more accessible.
 - **Fairness.** Carbon financing for the clean and improved cooking sector evokes ethical considerations stemming from the involvement of low-income households in carbon projects. There is currently little transparency around how stakeholders involved in clean and improved cooking carbon projects balance economic and moral considerations, particularly in relation to sharing risks and revenue. Concerns around

the unfair distribution of generated benefits raise doubts with prospective buyers who could move away from the sector if they believe their contributions are not reaching communities on the ground. More visibility on benefit-sharing arrangements and how these models can contribute to incentivizing the continued use of clean and improved cooking technologies can propel investments into the sector and ensure that future growth is equitable and responsible.

- **Sustainability.** To ensure sustainable growth of the clean and improved cooking sector, carbon finance should be leveraged in harmony with

other forms of funding and should do no long-term harm to local clean and improved cooking markets. Complementarity between carbon finance and other forms of funding, such as official development assistance (ODA) and philanthropic capital, is key to incentivizing sector development and making optimal use of public funds.

- **PART 4** closes with an overview of the next steps planned for the development of a Code of Conduct that aims to address the risks explored in this report.

A woman prepares food using an efficient woodburning stove.
© Peter Irungu /
Clean Cooking Alliance



A woman prepares a meal using an electric induction cooker.

© Pratik Shrestha / Clean Cooking Alliance



PART TWO

The Principles for Responsible Carbon Finance in Clean Cooking

The Principles presented here are intended as aspirational guideposts that outline how carbon finance can be delivered responsibly and sustainably in the clean and improved cooking sector. They provide a first step toward the development of a voluntary Code of Conduct that will outline best-practice examples for their implementation. Until then, the objectives of these Principles are to promote best practices in the sector, mitigate evolving risks, and lay the foundations to develop such a code.

The Principles are designed to complement existing sector action — filling gaps where they exist and raising ambition where it is lacking. They do not aim to replace the other valuable initiatives working on quality issues in the broader carbon market, such as the Core Carbon Principles of the ICVCM or the Claims Code of Practice of the Voluntary Carbon Markets Integrity Initiative (VCMI). The Principles have been developed for clean and improved cooking sector-specific issues and as such serve to provide additional guidance that

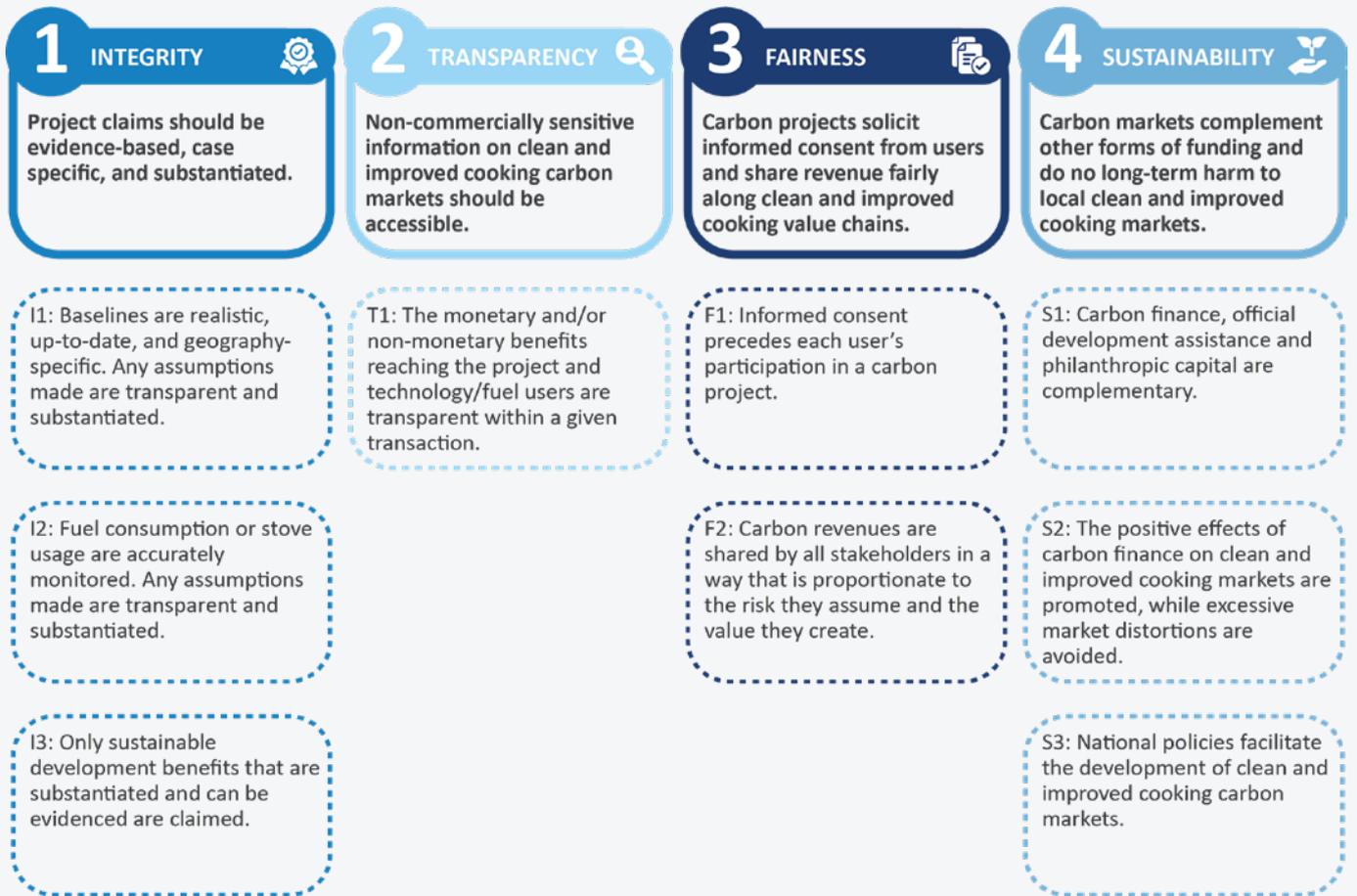
recognizes the unique challenges and opportunities for stakeholders in the clean and improved cooking carbon market. They are intended to be aspirational and transformative, but at the same time to provide a clear course of action for market actors in the short term.

For each principle, a short explanation is provided of the key risk it addresses, followed by a definition of the key terms used in the principle. Annex 1 details market actors and their various roles in clean cooking. Annex 2 lists examples of key actions that relevant market actors could take to fulfill a given principle. These are provided for illustrative purposes only.

The Principles are organized into four overarching themes, as illustrated in Figure 1. These Principles strive for a mature, flourishing carbon market that operates sustainably with integrity, fairness, and transparency. We believe that these Principles can help build the underlying conditions of trust and confidence needed for this market to flourish and help buyers participate in carbon markets with confidence.

FIGURE 1

The Principles for delivering responsible carbon finance





BOX 1

The Principles' development process

The Principles outlined in this report are the outcome of a participatory consultation process developed by the Clean Cooking Alliance in collaboration with Climate Focus and the Stockholm Environment Institute. The consultation process was centered around a series of working group meetings conducted under the Responsible Carbon Finance for Clean Cooking Initiative (RCF4CCI) and involving 537 stakeholders from across the clean and improved cooking and carbon market landscape.¹² Participants included project developers; investors; climate financiers; carbon standards; nongovernmental organizations; market facilitators; service providers; and carbon credit buyers, sellers, and intermediaries.

The first phase of working group meetings enabled stakeholders to develop a shared understanding of risks, issues, and opportunities under each of the above risk areas. Expert interviews with 25 individuals and three surveys were used to complement working group meetings and capture the perspectives of different market actors.

During the second phase of working group meetings, draft Interim Principles were shared with participants for discussion and validation. Stakeholders' expertise was used to understand the activities, behaviors, and norms that underlie each principle and to guide the recommended actions for each group of actors.

The draft Interim Principles underwent a consultation during an in-person meeting with all co-chairs of the RCF4CCI in Nairobi, Kenya, in September 2023. This meeting created a set of Interim Principles that went into a wider public consultation between 28 November 2023 to 31 January 2024. Feedback was received from a wide range of relevant stakeholders including project developers, research institutions, investors, carbon credit buyers, consultants, cookstove distributors and global development partners.

In addition, the Principles went through a final round of review by the [Responsible Carbon Finance Advisory Council](#) in May 2024.

Integrity

Project claims should be evidence-based, case specific, and substantiated.

I1: Baselines are realistic, up-to-date, and geography-specific. Any assumptions made are transparent and substantiated

This principle addresses the risk of over-crediting due to the overestimation of baseline emissions for clean and improved cooking carbon projects.

The terms included in the principle are defined as follows:

- *Realistic.* Baselines are accurate and true to life. The parameters applied to calculate emission reductions are aligned with scientific evidence (i.e. peer-reviewed journals) whenever it is available. Where unavailable, baseline data is collected in a manner that is scientifically sound (e.g. random sample selection, statistically sound sampling size, non-biased data collection approach, non-leading survey questions).
- *Up-to-date.* Baselines are calculated following carbon accounting methodology versions that are not more than 5 years old.
- *Geography-specific.* Projects strive to develop baselines that are specific to their target population and location of implementation.
- *Assumptions are transparent and substantiated.* For parameters that require assumptions, the applied parameter must be based on the best available data, err on the side of caution to ensure that emission reductions are not overestimated and be clearly and transparently articulated.

I2: Fuel consumption or stove usage are accurately monitored. Any assumptions made are transparent and substantiated

This principle addresses the risk of over-crediting due to the overestimation of project performance.

The terms included in the principle are defined as follows:

- *Fuel consumption or stove usage.* Refers to the use of the project and baseline stove/fuel(s) during the project. Depending on the methodology applied, these parameters include the adoption rate of the project stove (i.e., number of households receiving a program stove), the dropout rate (i.e., households not using the project stove), stove stacking (i.e., the use of the baseline stove along with the project stove), the portion of time the project stove is used, and the quantity of fuel used in the project scenario. Any monitoring should ensure that the rebound effect – in which a user cooks more due to the new stove – is accounted for.
- *Accurately monitored.* Using monitoring techniques or technologies that measure the parameters of interest with low uncertainty. This includes data loggers and metering for stove use and purchase receipts for fuels. When sampling is applied, a robust sampling approach is applied such as that outlined by the Clean Development Mechanism's *Guideline: Sampling and surveys for CDM project activities and programmes of activities*.
- *Assumptions made are transparent and substantiated.* When monitoring techniques that accurately quantify the parameters of interest are too expensive or not available for a particular project technology, monitoring assumptions must be based on the best available data, err on the side of caution to ensure that emission reductions are not overestimated, and be clearly and transparently articulated.

13: Only sustainable development benefits that are substantiated and can be evidenced are claimed

This principle addresses the risk of sustainable development benefits claimed by projects not materializing. The delivery of sustainable development benefits is important in differentiating carbon credits from clean and improved cooking projects from other types of carbon projects so it is important that claims made are delivered. It also aims to create a level playing field for sustainable development claims to ensure that such claims can be made only if they are substantiated and verifiable.

The terms included in the principle are defined as follows:

- *Sustainable development benefits.* Impacts yielded by a clean and improved cooking program in addition to climate impact. This could mean generating employment, extra income/monetary benefit sharing from carbon generation (SDG 1), improving health, and increasing safety and well-being, among other things.
- *Substantiated.* Publicly available project documentation outlines the rationale and evidence to support the claim in a robust manner. Peer-reviewed tools shall be used to evidence sustainable development claims (e.g. the Gold Standard’s ADALys methodology, the Gold Standard’s SDG Impact Tool, Verra’s SD VISTA, W+ Standard)
- *Evidence.* All evidence used to support the claim must be available upon request by a buyer or other third party (e.g., a verifier).

A woman prepares food using an efficient woodburning stove.
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Transparency

Non-commercially sensitive information on clean and improved cooking carbon markets should be accessible.

T1: The monetary and/or non-monetary benefits reaching the project and technology/fuel users are transparent within a given transaction

Transparency is a prerequisite for determining the fairness of carbon markets for clean and improved cooking. This principle addresses the opacity regarding the monetary and non-monetary benefits that reach projects and technology/fuel users on the ground. It may be reasonable to withhold some sensitive commercial information, but that should not be used as a pretext for avoiding transparency.

The terms included in the principle are defined as follows:

- *Transparent.* Transparency requires that information about the monetary and/or non-monetary benefits reaching the project and technology/fuel users in the carbon value chain of a given transaction is available to actors within that transaction or, ideally, made public.
- *Monetary benefits.* Are benefits that are provided in monetary form e.g. cash payments to technology users, payments into community funds, loans provided for purchases, or prices paid for carbon credits.
- *Non-monetary benefits.* Are benefits that are not provided in monetary form e.g. subsidized technologies/fuels, maintenance and repair services offered, up-skilling/training provided to the workforce, employment opportunities for women, or income security and reduced investment risk provided for project developers by offering long-term fixed offtake agreements.
- *The project.* Refers to the carbon project underlying the carbon credit that is being transacted.
- *Technology/fuel users.* Refers to the technology/fuel users that are targeted by the project defined above.
- *Within a given transaction.* Refers to the value chain of a single carbon credit transaction i.e. the transfer of carbon credits in exchange for payment in a single transaction. This does not seek public disclosure of monetary and/or non-monetary benefits, nor sharing of information to entities not involved in the single transaction under consideration.



A woman prepares food using an efficient woodburning stove.
 © Peter Irungu / Clean Cooking Alliance

Fairness

Carbon projects solicit informed consent from users and share revenue fairly along clean and improved cooking value chains.

F1: Informed consent precedes each user's participation in a carbon project

The rights to carbon credits remain with the entity generating an emission reduction unless the users of the technology sign an agreement to transfer rights to the carbon credits to another entity. This principle addresses the risk that cookstove/fuel users do not fully understand the contracts they sign and that as a result they do not make sufficiently informed decisions to participate.

The terms included in the principle are defined as follows:

- **Informed consent.** Cookstove and fuel users must have a complete understanding of the consequences of their participation in a carbon project. This includes that:
 - They are informed of the purpose of their participation, understand what they are agreeing to, and that they can withdraw their consent.
 - They are aware of the available alternatives, such as buying a stove without a subsidy, if they choose not to transfer their rights to carbon credits.
 - Consent is freely given without deception, intimidation, or coercion, if the user does not consent.
 - They thoroughly read and understand any legal agreement transferring the rights to carbon credits before signing it. Such agreements consist of clear and simple language that can be expected to be understood by the cookstove/fuel user. Agreements can also be accompanied by visual aids to help explain key concepts and implications for cookstove/fuel users.
- **Participation.** This refers to formal participation in the carbon project, usually through signing an end-user agreement transferring the rights to carbon credits, and also through being employed by the project or taking on some other role. This goes beyond being “engaged,” for instance, through consultations.

F2: Carbon revenues are shared by all stakeholders in a way that is proportionate to the risk they assume and the value they create

This principle addresses the fact that cookstove and fuel users have a key role in generating carbon credits and should therefore directly benefit from them. It also ensures that intermediaries and investors capture shares of carbon revenues that are proportional to the risks they take on and the value they create.

The terms included in the principle are defined as follows:

- **Carbon revenue.** The revenue generated through the sale of carbon credits, as a function of the number of credits issued and the price(s) paid for them.
 - When shared with users, revenues can be shared directly through monetary payments or indirectly through free maintenance or services that do not involve financial transfers. Alternatively, the cost of the cooking technology or fuel can be lowered by subsidizing the technology. Any revenue sharing is proportional to the degree of risk taken by users and the device subsidy received (e.g., a free stove requires no risk from the user; once a price is paid for a stove, the user has taken on a risk). Households that invest more of their own capital in the stove or use it more frequently proportional to the baseline stove (where monitoring approaches allow for determining this) could reasonably claim a larger share than others.
 - When shared with intermediaries (e.g. aggregators/retailers, brokers, trading companies and trading desks, exchanges) or investors, the fees charged by intermediaries or the margins they retain when buying and selling credits is proportionate to the risk they assume and the value they create.
- **All stakeholders.** Includes all actors involved a single carbon credit transaction that are involved in either transferring carbon credits or payment(s) for them. This includes the technology user (e.g. household), project developer, any intermediaries

(e.g. brokers/traders), investors and the final carbon credit buyer. For example, an intermediary may provide information regarding the share of revenues that reach the project developer, who may in turn provide information on the portion of revenue that reaches cookstove users. Information on how revenue is shared may be provided directly to the buyer(s) as part of the broader project information or with other actors within the value chain of a given transaction. It could also be made public, for instance, in marketing materials for the project or in project design documents/monitoring reports. It may be reasonable to withhold some sensitive

commercial information, but that should not be used as a pretext for avoiding transparency.

- *Proportionate.* Any fees charged or margins withheld are reasonable in light of the services provided and the risks actors assume. This amount will vary depending on the role stakeholders play, as well as market conditions. For instance, it is reasonable to expect investors that provide upfront finance for project costs or that enter into forward contracts to seek higher margins than brokers that simply facilitate spot transactions, since the former assumes more risks than the latter.

A woman prepares food using an electric induction cooker.
© Pratik Shrestha / Clean Cooking Alliance



Sustainability

Carbon markets complement other forms of funding and do no long-term harm to local clean and improved cooking markets.

S1: Carbon finance, official development assistance and philanthropic capital are complementary

When a project benefits from multiple sources of financing, there is a risk that any one of these financing streams becomes redundant to the project's viability, raising questions about the optimal use of public donor funds. This principle aims to address this issue by ensuring that any funding awarded to a given project is complementary, rather than duplicative.

The terms included in the principle are defined as follows:

- *Official development assistance.* Government aid that promotes and specifically targets the economic development and welfare of developing countries, including in the clean and improved cooking sector. Aid may come in the form of grants, direct investment, or concessionary finance.
- *Philanthropic capital.* Private funding that is intended to create social impact delivered either as an outright gift with no expectation of financial return or as an asset whose return on investment is less than the market rate.
- *Complementary.* Finance that is delivered to enhance impact and avoid duplication and overlap. Financing is coordinated to ensure that any amount provided does not exceed the amount necessary to overcome market barriers.

S2: The positive effects of carbon finance on clean and improved cooking markets are promoted, while excessive market distortions are avoided

Carbon finance plays a pivotal role in accelerating the transition to clean and improved cooking solutions by channeling investments into innovative technologies and business models. By incentivizing good practices, such as better customer care that leads to higher usage rates, carbon finance brings positive distortions to many poorly functioning markets.

However, it is crucial to strike a balance between market stimulation and maintaining a level playing field. Excessive market distortions, such as over-reliance on subsidies or unbalanced incentives can hinder competition, stifle innovation, and can lead to unintended consequences that undermine sustainability. Therefore, this principle emphasizes the need for responsible carbon financing practices that foster transparency, accountability, and fair competition, ensuring that clean and improved cooking markets can thrive without excessive market distortions.

This principle is not relevant in areas where there is little to no market potential (e.g. areas of extreme poverty), but can occur in emerging markets that are home to a customer base that could afford to pay an amount for the cooking technology offered.

The terms included in the principle are defined as follows:

- *Market distortions.* Market distortions occur when carbon finance impacts the normal operation of a market, creating advantages for participants who have access to carbon finance. This positive market distortion is welcomed as a means of enabling the transition to cleaner cooking solutions.
- *Excessive (market distortions).* Market distortions become excessive when the degree or magnitude of distortion goes beyond what might be considered reasonable or necessary for achieving access to clean or improved cooking technologies. According to the Donor Committee for Enterprise

Development (2018) market distortions from private sector engagement can include that (i) the market power of the individual company [benefiting from carbon finance] is reinforced at the expense of other firms, (ii) barriers to market entry increase [for firms not benefiting from carbon finance] and, (iii) information asymmetries are reinforced. For example, if the level of subsidy provided by carbon finance distorts competition to the extent that it stifles innovation, creates market inefficiencies, or affects consumer choice without proportionate benefits, it would be considered excessive.

S3: National policies facilitate the development of clean and improved cooking carbon markets.

This principle recognizes the need for policymakers to deliver an enabling environment for domestic clean and improved cooking activities by clearly defining the rules of the game for market participants. This involves facilitating a regulatory environment that attracts, or at least does not disincentivize the provision of, international/national financing for carbon markets. This includes providing advanced regulatory certainty that allows financiers to make informed investment decisions.

It is important that decisions are the result of a consultative process and deliver long-term clarity for project developers and investors.



A man sells food prepared in a gas stove.
© Mauro Vombe / Clean Cooking Alliance

A woman prepares food using an electric induction cooker.
© Pratik Shrestha / Clean Cooking Alliance



PART THREE

Rationale for development of the Principles

Integrity

Project claims are evidence-based, case-specific, and substantiated.

Questions about the true climate impact of carbon projects have recently permeated carbon markets. Activities distributing clean and improved cooking technologies and fuels have not been exempted from this criticism, with concerns being raised about the reliability of emission reductions claimed by certain clean and improved cooking activities. This is affecting buyer demand for carbon credits and impacting financial flows to the sector. The impact extends to clean and improved cooking carbon projects that apply best practices for measuring and reporting climate impacts, which risk facing operational challenges due to their dependence on reliable carbon finance flows. Efforts that promote and safeguard the climate integrity of carbon markets are critical to ensure that the sector remains attractive to investors and that the market can scale responsibly.

The robustness of impact claims of clean and improved cooking activities also extends to the sustainable development benefits that these projects contribute to.¹³ While worries over climate integrity currently dominate the discussion on impact claims (i.e., the compensatory claims attributed to carbon credits), there is also scrutiny of the sustainable development benefit claims as buyers weigh the broader impacts that carbon projects can deliver. This is especially important for the clean and improved cooking sector,

which has maintained strong buyer interest relative to other project types through its ability to deliver lasting socioeconomic benefits beyond climate change mitigation. These include, among other benefits, improving household health and safety, reducing poverty, and promoting employment through the production and sale of technologies and fuels in local markets.¹⁴ Sustainable development benefits are, however, sometimes hard to measure and directly attribute to the carbon project. And translating these benefits into a monetary value is even harder, making it challenging for carbon credit buyers to determine how much to pay for these sustainable development benefits. Improved transparency around the measurability and durability of these benefits will help to ensure that carbon credits from clean and improved cooking carbon projects attract carbon prices that are commensurate with the carbon and non-carbon benefits they deliver.

This section dives deeper to explore the nature of these integrity concerns by outlining the reasons for concern over the greenhouse gas (GHG) integrity of carbon credits from clean and improved cooking solutions as a backdrop for the need for principles addressing this and by describing the challenges of conducting robust measurement of sustainable development benefits associated with these activities. This analysis is complemented by an overview of ongoing efforts to support high-integrity carbon markets that promote both climate and sustainable development benefits.

Three Principles address these integrity concerns:

- I1: Baselines that are realistic, up-to-date, and geography-specific. Any assumptions made are transparent and substantiated.
- I2: Fuel consumption or stove usage are accurately monitored. Any assumptions made are transparent and substantiated.
- I3: Only sustainable development benefits that are substantiated and can be evidenced are claimed.

Quantifying climate impact

The carbon market is a market-based mechanism that aims to deliver cost-effective climate impacts in the form of carbon credits that buyers can use against their climate goals. Demand for carbon credits therefore rests on the market’s ability to deliver reliable and accurate emission reductions that can be used for compensatory or other relevant climate claims.

GHG emission reduction accounting for the clean and improved cooking sector has been evolving ever since the first methodologies were introduced under the Clean Development Mechanism (CDM) in the late 2000s.¹⁵ The certification of clean and improved cooking activities is dominated by three carbon standards — the CDM, the Gold Standard, and Verra’s Verified Carbon Standard (VCS) (see Market Snapshot above)¹⁶ — which have also led to the development of methodological rules and requirements to which clean

and improved cooking carbon projects must comply.¹⁷ Several methodologies can be used to estimate emission reductions, but just four account for most of the issuances to date (see Market Snapshot).

“Digital monitoring can guarantee quality by accurately tracking stove performance.”

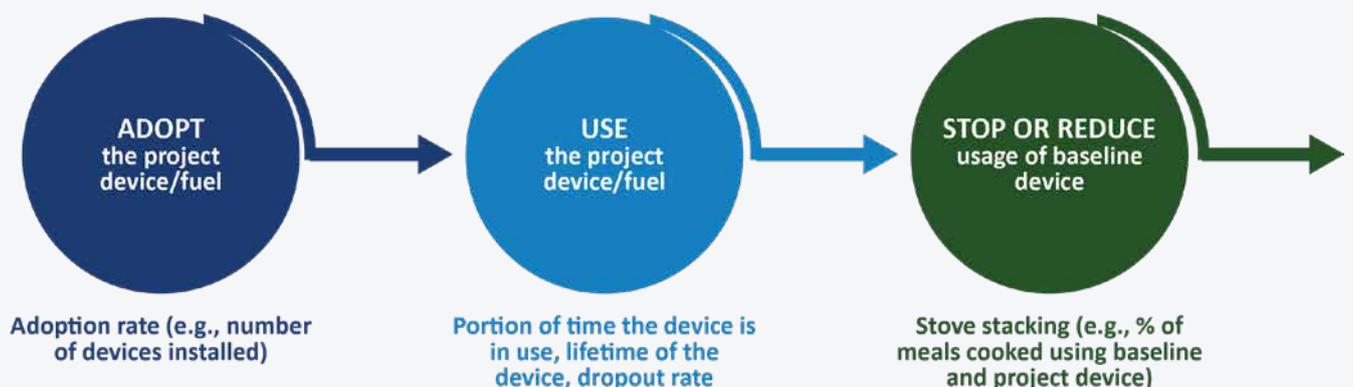
– Project developer, sharing their views as part of the RCF4CCI

Despite this track record, recent academic research¹⁸ points toward risk areas that are undermining the robustness of climate impacts claimed by certain clean and improved cooking activities certified in the carbon market. These issues primarily relate to approaches for setting parameters that define the performance of carbon projects, which can differ depending on which methodology and cookstove technology is applied. This is not in itself an issue; clean and improved cooking technologies are diverse and national data availability may limit the application of certain options. At the same time, not all approaches are equally robust, introducing risks that emission reductions reported by projects are overstated.

Clean and efficient cooking projects reduce emissions to the extent that technology users adopt the project device or fuel; use the project stove and therefore reduce the fuel used for cooking their daily meals; and stop or reduce the use of the baseline stove concurrent with the project stove (referred to as “stove stacking”) (Figure 2).

FIGURE 2

A project’s emission reductions depend on the extent to which the technology users adopt and use a project stove and reduce the fuel consumption.



Since the primary use case for carbon credits is to compensate for emissions elsewhere, it is critical that over-crediting risks are eliminated or effectively managed. On the flip side, projects that understate their climate impact will receive lower volumes of carbon credits and subsequently may not be financially viable unless sufficiently high carbon prices are offered. A delicate balance, therefore, needs to be struck in which projects are realistic in their emission reduction reporting without available methodologies enforcing an unwarranted level of conservativeness that risks undermining the positive impact that clean and improved cooking activities can deliver.

Table 1 offers a summary of the most critical parameters in emission reduction calculations for clean and improved cooking carbon projects. These range from input parameters that determine the

baseline scenario and associated emissions (e.g., fraction of non-renewable biomass, fuel use trends before the project) to values that track implementation performance and effectiveness of the introduced cooking technology (e.g., number of stoves distributed, fuel use during the project). Establishing these parameters is challenging, and existing methodologies allow several approaches for doing so. Depending on the parameter, this includes applying a conservative default value, using data from peer-reviewed scientific literature, applying a calculation tool, conducting a statistically sound sampling survey, or measuring performance directly.

The criteria outlined in this section are not comprehensive but focus on the most material values that go into calculating an emission reduction for a clean or improved cooking project.¹⁹

TABLE 1
Summary of approaches to establishing the most critical variables used in emission reduction calculations in clean and improved cooking carbon projects.

VARIABLE	CONSERVATIVE DEFAULT	SCIENTIFIC LITERATURE	CALCULATION TOOL*	SAMPLING SURVEY	MEASUREMENT**
1. Fraction of non-renewable biomass	•	•	•		
2. Fuel use:					
a) Before the project	•	•	•	•	•
b) During the project			•	•	•
3. Number of project devices installed					•
4. Project devices in use				•	•
5. Wood-to-charcoal conversion factor	•	•			

*Calculation tools can include Tool 30 to calculate fNRB, or the Water Boiling Test/Controlled Cooking Test to determine energy use performance of the project stove.

**Measurement approaches include deploying data loggers to monitor the use of the project stove, using Kitchen Performance Tests to measure quantities of fuels used in the baseline and project, or tracking the number of stoves installed in a project database.

FRACTION OF NON-RENEWABLE BIOMASS

When clean and improved cooking activities are implemented in areas where the baseline fuel use consumption exceeds the annual growth potential of surrounding forest stocks, this “non-renewable” share of fuel determines the ability of a clean or more efficient cookstove technology to reduce emissions. To determine this share, project developers need to define the proportion of woody biomass — known as

the fraction of non-renewable biomass (fNRB) — that would be depleted in the absence of the intervention.

To reduce the burden for project developers to self-calculate this fraction on a case-by-case basis, in the early 2010s the CDM introduced country-specific default values that were approved by designated national authorities. While these default values have now all expired,²⁰ they provided a precedent that set expectations for high national fNRB values ranging from

65% to 100%. This value range has become standard practice in both CDM projects and voluntary carbon projects certified under the Gold Standard and Verra's VCS and reflected the best available science at the time.²¹ Further research has since revealed that fNRB values are likely to be considerably lower across most developing countries.²² In response to these findings, the CDM has revised the approach to determining the fNRB by offering the following three options to project developers:

- Applying a global default value of 0.3
- Using a value sourced from peer-reviewed literature
- Applying a value obtained through a methodological tool developed specifically for calculating fNRB (as per Tool 30)²³

While the first two options offer the easiest and most transparent solution, they tend to lead to considerably lower emission reduction outcomes than clean and improved cooking carbon projects have come to expect. The first approach, the default value, is a global average, meaning that some regions will have an fNRB value that is lower and others will have one that is higher. The second approach, based on peer-reviewed literature, generally yields higher fNRB values than the default of 0.3 but results in values that are lower than those adopted by most clean and improved cooking carbon projects in the carbon market. Aiming to maximize their ability to generate carbon credits, most project developers opt for pursuing the third option to determine the fNRB. Following the methodological steps defined in Tool 30, this approach can result in a wide range of possible outcomes based on which input values and assumptions are used.

When following the methodological steps of Tool 30, the outcome of the fNRB value is highly dependent on the amount of wood consumed in a country (both commercially and domestically), the extent of protected forest areas, the degree of inaccessibility to local forests, and the forest's annual incremental growth rate. While some national statistics offer data²⁴ on forest categorization and the extent of protected forest areas, significant data gaps remain. In addition, the approach for defining other inputs via Tool 30 leaves room for interpretation that can generate fNRB values that are significantly higher than those found in peer-reviewed literature.²⁵ Recognizing this issue, Verra's VCS recently introduced a requirement for

projects applying the tool in combination with one of its improved cooking methodologies to introduce an "uncertainty deduction" that brings down the calculated emission reductions by 26%.²⁶ However, on an overall market level this does not yet guarantee that carbon projects will systemically apply realistic fNRB values to calculate claimed emission reductions, and registered projects are not required to update the applied fNRB value until crediting period renewal.

Ultimately, generating greater confidence in fNRB values will benefit all parties across carbon markets. In October 2023, the United Nations Framework Convention on Climate Change (UNFCCC) released a public consultation on fNRB values established by Bailis et al. (2023) based on new spatial modeling.²⁷ This could allow for emission reduction calculations to be grounded in detailed localized analysis, enabling greater accuracy. A decision on whether to approve the new values is expected in 2024.

FUEL AND COOKING DEVICE USE

There are several approaches to determining fuel use before and during the project. Some of these are also used to establish project device usage, as summarized in Table 1. The approach adopted in each project will depend on which GHG accounting and monitoring methodology is applied and what is most suitable for a project given its characteristics and availability of baseline data. Depending on the methodology, a project developer may also choose to combine some of these approaches, such as applying a default value for baseline fuel consumption and conducting surveys to determine project fuel consumption. The advantages and disadvantages of each approach are outlined in Table 2. In some situations, projects may also develop suppressed demand baselines (Box 2).

Baseline default values. The UNFCCC publishes global default values for the quantity of fuel used before a project starts (i.e., baseline fuel use). Because these are default values, they must be conservative and thereby underestimate the amount of fuel likely used in the baseline. Until recently, the value for the average annual consumption of woody biomass used per person for cooking was 0.5 tonnes (on a "wet" basis, i.e., the biomass has not been dried). After reevaluation, this was revised in 2022 to 0.4 tonnes per person each year; the validity of this default value is to be reassessed every three years.²⁸

BOX 2

Suppressed demand in determining baselines

In some situations, the amount of fuel a household uses for cooking is constrained by external factors such as the availability or affordability of fuel. This means that the amount of fuel used is below what would be needed to meet basic human development needs. In such cases, a project can develop a suppressed demand baseline that assumes households use the amount of fuel to meet minimum service levels necessary to provide for basic, adequate human needs rather than the actual amount of fuel they use for cooking. This allows the poorest countries and communities to access carbon finance before raising their baseline to a level that makes carbon financing work in the absence of a suppressed demand baseline, while also meeting development objectives by allowing the poorest populations to leapfrog to cleaner technologies.

Suppressed demand approaches are permitted under the Gold Standard and CDM, primarily as a mechanism of fostering the sustainable development objectives of those standards. The basic premise of suppressed demand is that it avoids greenhouse gas emissions occurring in the future under the scenario that countries progress on their development trajectories, even if emission reductions are not achieved at the time of starting to issue carbon credits.²⁹ This approach relies on assumptions and involves raising the baseline fuel use beyond that which occurs.³⁰

Scientific literature or national household/ demographic surveys. These can be used to establish the quantities and types of fuels used before a project (i.e., baseline fuel use). Scientific literature refers to peer-reviewed publications, and national household/ demographic surveys refer to studies carried out by host country governments to establish population statistics. These surveys usually cover a broad range of topics and are not developed exclusively for clean and improved cooking carbon projects, but they can provide useful information on household size or the types of fuels typically used in the baseline.

Surveys. Surveys relate to questionnaires and on-site inspections of the project cookstove and kitchen space to determine whether the project stove is in use and whether other (baseline) stoves are being used in parallel. To derive fuel and device use, surveys can include asking users how many meals a day are cooked on the project stove or how much fuel is used for cooking (although this is often challenging for a user to estimate and may require calculation assumptions such as translating a “bag of charcoal” into a weight measurement). Surveys must be statistically sound, with discounts applied on eventual emission reductions if statistical boundaries are overshoot by a small margin (larger overshoots are not permitted issuance).

However, surveys are vulnerable to social desirability and recall biases. Even if the survey is well designed to establish performance, social desirability bias — a

phenomenon that occurs when participants provide responses that they believe the surveyors want to hear — can affect the results and may lead to over- or underestimating usage. Households may also have trouble remembering stove use over the desired time period (recall bias). Obtaining accurate survey results also requires the respondent and surveyor to interpret the question and answer correctly, and therefore demands a skilled surveyor and careful question design that can anticipate these difficulties. Despite these challenges, surveys are currently the most widely used approach in estimating fuel use in cookstove projects.

Energy use performance to derive efficiency. Projects employing improved efficiency cookstoves can also determine performance based on the differences in efficiencies of the project and baseline stoves. This is done by establishing the efficiency of the project stove via a Water Boiling Test or a Controlled Cooking Test. The WBT is a laboratory-based test used to establish the project stove’s efficiency, but because it is carried out in a controlled setting it does not accurately represent real-world cooking behavior.³¹ The CCT, which occurs on-site and compares the amount of energy used to prepare identical meals using different stoves, can capture real-world usage more accurately. It is not commonly applied in cookstove projects, however, due to the additional effort required with its implementation. Furthermore, existing testing protocols give limited guidance on certain aspects of

the test, including how to handle different stove and fuel combinations.³² This risks yielding inconsistent results and low reproducibility of the observed efficiency levels.³³

Kitchen Performance Tests. A KPT is an on-site test to measure fuel use in the kitchen. A KPT involves physically measuring the amount of fuel used over a three-day period in the user’s kitchen, allowing a project to capture in-kitchen use rather than conducting a lab test. A well-performed KPT is more reliable at capturing fuel use than surveying or estimating fuel use based on the efficiency of the project stove as it relies less on the subjectivity of the respondent and captures the household’s actual cooking practices — including the possible use of a concurrent baseline stove. It is also able to capture any possible rebound effect that may occur during the project.

However, KPTs are expensive, time-consuming, and not without weaknesses. Like the social desirability bias that can occur during surveying, the household may change their behavior in the presence of project staff who can observe their stove choices while weighing the fuel.³⁴ To guard against overestimating the amount of fuel saved, carbon accounting methodologies require that KPTs be carried out at a time that will yield conservative estimates, such as during the dry season when fuelwood is lighter and avoiding holidays

when the number of eaters in a household — and the corresponding fuel use — would increase. Getting this timing right is challenging. In addition, methodologies require a KPT to be performed only once every two years to keep costs manageable.³⁵ Furthermore, some projects may supply fuel for the household to use during the KPT, which can affect the reliability of fuel use measurements.

Thermal energy output. This calculation method allows projects to back-calculate the amount of fuel that would have been used in the baseline based on the amount of energy that a project stove delivers and the difference in efficiencies of the baseline and project stove. Since this approach avoids having to conduct a baseline survey to establish the quantity of fuel used in the baseline, it is relatively inexpensive to apply.

Data loggers or metering. The most reliable method of estimating performance is via data loggers or metering. Data loggers are devices placed on the project stove that measure actual fuel usage and can involve tracking electricity or liquid fuel flow. While these values alone will not yield a direct measurement of stove and fuel stacking, they do allow for tracking how much the project technology is used, which can in turn paint an accurate picture of how much stove stacking is likely to occur given the user’s energy needs. It also enables tracking the usage rate and the portion of clean and improved solutions in operation.



A woman heats water over a clean, electric induction cooker.

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TABLE 2

Overview of approaches to establishing fuel use prior to the project start date and during the project.

APPROACH	ADVANTAGES	DISADVANTAGES	IMPACT ON CLIMATE INTEGRITY
Apply a conservative global default value published by the UNFCCC	Low cost and low risk of nonacceptance at validation	Conservative, and may be overly conservative for the given project area, leading to lower emission estimations.	Will lead to under-crediting for this value.
Relying on scientific literature or national household/demographic surveys	Low cost	Can be unavailable, out-of-date or include information about the type(s) of fuel(s) used but not the quantity. Can also be difficult to confirm the reliability of the method(s) used to gather data. National demographic surveys risk applying national averages that do not represent the project's specific target population.	Quality of data will depend on the value chosen and how well that aligns with other literature sources.
Energy use performance to derive efficiency: Estimating fuel savings based on difference in efficiencies of the baseline and project stove and fuel use in the project scenario	No need to establish baseline fuel use, only project fuel; low cost	Stove testing centers may not be locally available to reliably establish thermal efficiencies.	Efficiencies established through lab tests do not reflect real-life stove use, likely overestimating stove performance relative to in-kitchen use; ³⁶ low reproducibility of efficiency test results; risk of baseline inflation if the project stove is used more than it would have been prior to the project (rebound effect).
Sampling surveys to establish location-specific fuel use without measuring fuel use	Establishes project-specific data, with results needing to be statistically sound	Expensive, vulnerable to social desirability and recall biases. Higher risk of issues arising during validation.	Outcomes rely heavily on the questions asked and assumptions made in data analysis thereafter. ³⁷
Kitchen Performance Test (i.e., measuring fuel use)	Establishes project-specific data, with results needing to be statistically sound	Most expensive option; vulnerable to social desirability biases (although less so than surveys).	Most reliable outcome that also captures any rebound effect, but care must be taken to sample at a time of year that would yield conservative estimates (e.g., avoid holidays and the wet season).
Estimating fuel savings based on the thermal energy output of the project stove and difference in efficiencies of the baseline and project stove	Relatively low cost and well-established approach	Stove testing centers may not be locally available to reliably establish thermal efficiencies; highly dependent on accurate surveying of the number of utilization hours.	Efficiencies established through lab tests do not reflect real-life stove use, likely overestimating stove performance; low reproducibility of efficiency test results; risk of baseline inflation if the project stove is used more than it would have been in the baseline (rebound effect).
Data logger or fuel meter	Directly measures energy or fuel consumed	Data loggers can be expensive, although device costs are falling. Large amount of data may require expertise to analyze.	Most reliable outcome for project device usage but does not capture stove stacking unless data loggers are also placed on baseline stoves. Not compatible with all stoves.

WOOD-TO-CHARCOAL CONVERSION FACTOR

The wood-to-charcoal conversion factor is an important input parameter in the emission reduction calculation of cookstove activities that use charcoal in the baseline and/or project scenario. It expresses the amount of firewood that is needed to produce a kilogram of charcoal. The conversion factor is affected by the density of the wood used, the moisture content of the wood, and the efficiency of the kiln used to produce charcoal.³⁸ While modern kilns can produce 1 kilogram of charcoal from only 3 kilograms of firewood, traditional and inefficient kilns can need up to four times that amount of woody biomass to produce the same volumes of charcoal (i.e., up to 12 kilograms of firewood to produce 1 kilogram of charcoal).³⁹ Historically, the firewood-charcoal conversion default proposed under the CDM has been 6-to-1 — i.e., that it takes 6 kilograms of wood to produce 1 kilogram of charcoal. This has recently been adjusted to be more conservative by assuming a default factor of 4 kilograms of wood to produce 1 kilogram of charcoal.

All methodologies, however, allow for project developers to determine project-specific values for this parameter. Projects that choose to apply a national value often base their wood-to-charcoal ratio on national or scientific literature. Because literature shows the wood-to-charcoal value can vary considerably depending on local circumstances,⁴⁰ a national value can still lead to over-crediting unless a value representing the most efficient production processes in the country is selected.

ONGOING EFFORTS TO ADDRESS INTEGRITY ISSUES

Climate integrity concerns of carbon projects have been a leading discussion topic over the past two years. Starting with incidental reporting on specific projects, the market is undergoing a thorough review promoted by a diversity of actors. Some aspects of this review relate to the carbon market more broadly, such as efforts to tighten overall market rulemaking and further define best-practice guidance, while others are sector-specific and relate to clean and improved cooking activities. These initiatives to improve climate integrity can be broadly categorized as follows:

- **Guidance initiatives.** The Integrity Council for the Voluntary Carbon Market was established in 2021 with the primary objective of improving the quality and governance of the voluntary carbon market (VCM). The ICVCM was born out of the efforts of the Taskforce on Scaling Voluntary Carbon Markets (TSVCM), which concluded that for the carbon

market to scale effectively, a clear road map is needed to determine a global benchmark for carbon credit quality. The ICVCM has since been actively developing this guidance and recently released a full set of criteria for assessing categories⁴¹ of credits and crediting methodologies, including the introduction of a minimum threshold standard for “high-quality carbon credits.”

- **Methodological revisions.** Over the years, carbon standards have proactively improved the quality of accounting methodologies. This includes updating methodologies to be in line with the latest scientific data and evidence, conducting regular methodological reviews, and prohibiting the use of older versions of a methodology once a new version has been released. In 2022, the CDM released a tool that significantly revised the default values permitted for use by clean and efficient cooking, making projects that apply these values more conservative in their emission reduction estimation.⁴² Over 50% of the clean and improved cooking carbon projects on the market today apply a CDM methodology,⁴³ with methodological decisions made by the UNFCCC continuing to influence the decision-making of other international standards. For example, Verra’s improved cooking methodology⁴⁴ has recently been updated to bring it in line with the CDM approach, and the Gold Standard refers to several CDM accounting tools. Despite these improvements, unaddressed issues remain (Box 3).
- **New methodologies.** Several new carbon accounting methodologies are either in development or have recently been released, aiming to open carbon markets to new technologies or improve existing GHG accounting approaches (although not all new methodologies are successful in this). The Clean Cooking and Climate Consortium (4C) — a partnership started by the Clean Cooking Alliance and also involving the U.S. Environmental Protection Agency, UNFCCC, the Climate and Clean Air Coalition, Berkeley Air Monitoring Group and the Stockholm Environment Institute — is developing a consolidated methodology for clean and improved cooking.⁴⁵ This methodology will be available for use by interested parties (e.g., under the VCM, Article 6.2 and Article 6.4, subject to approvals) and will be applicable to a variety of transition scenarios. Such consolidation allows streamlining of emission reduction outcomes and helps to level the playing field with regard to the basic approaches and input

parameters that different project types apply to account for emission reductions.

A new methodology for metered and measured cooking developed by ClimateCare and Modern Energy Cooking Services (MECS) has also been approved under the Gold Standard, opening carbon markets for metered and measured cooking solutions, including electric cooking and allowing for direct metering of performance.⁴⁶ Verra is also developing a methodology for improved cooking solutions that would replace its VMR0006 methodology.⁴⁷

- **New greenhouse gas accounting tools.** Several new tools aim to streamline parameters across projects and ease the burden of establishing local parameters for use in emission reduction calculations. For example, a global study published in the fall of 2023 outlines updated fNRB values.⁴⁸ Furthermore, 4C is working to develop a database of reference values for key parameters, including national and subnational disaggregation. This will lower costs and effort in developing project-specific input data without having to turn to conservative default values.
- **Comparative project evaluation.** Reflecting the market’s concerns around integrity issues and the need for greater transparency in project performance benchmarking, several carbon credit ratings agencies have entered the market to offer ratings services to buyers and investors. The growing availability of standardized risk assessments of individual carbon projects has allowed market participants to gain insight into carbon credit quality

aspects without the need to engage in detailed in-house project due diligences. Examples of carbon credit ratings agencies active in the market today are BeZero, Calyx Global, and Sylvera.

- **Performance measurement solutions.** Recognizing the need to better capture device performance, several companies active in the clean and improved cooking market are developing lower-cost and more reliable data loggers that enable active tracking of fuel use. Examples are biogas flow monitors, LPG use monitors, and electric meters that can establish fuel use in domestic programs.⁴⁹ Another example is the distribution of high-efficiency stoves that include built-in data loggers that allow project managers to track the performance of all devices in real time.⁵⁰ Technologies like these raise the bar in capturing performance but remain inaccessible for the majority of carbon projects on the market today.

While the market is making concerted strides to improve the integrity of climate impacts claimed, heterogeneity remains in the approaches that projects take to quantify emission reductions. This is a product of multiple methodologies with varying levels of reliability being available, coupled with projects issuing carbon credits from dated methodologies. Some projects make a concerted effort to ensure high reliability in emission reductions, and some do not. Projects that do so will choose the most reliable approaches to quantify baseline and project emissions despite these being more expensive and requiring more effort, and they will ensure that any assumptions made are conservative to avoid overestimating emission reductions.



Delivery of gas cookers.
© Daniel Mutema /
Clean Cooking Alliance

BOX 3.

Overlooked methodological issues

Some GHG accounting issues are not currently addressed, or are only partly addressed, in existing carbon methodologies for clean and improved cookstoves. These issues are not as pertinent as the issues covered above, with the overall magnitude of the impact of these on emission reduction outcomes likely to be small. Yet they are considered in scientific literature and by some carbon credit rating agencies and therefore warrant attention.

Rebound effect. In some cases, households will increase their overall fuel consumption for cooking after receiving an improved stove.⁵¹ This can occur when the improved stove lowers the effort of cooking and provides an extra burner, allowing the burning of more fuel. Projects that monitor fuel usage via KPTs would capture an increase in fuel use resulting from the rebound effect, but other monitoring approaches do not. That said, the impact of the rebound effect on overall claimed emission reductions is small.⁵²

Permanence. Clean and improved cooking carbon projects reduce emissions reducing the use of non-renewable biomass and therefore avoiding degradation of forests. Because forests are at risk of being destroyed or degraded by other factors such as forest fires, some stakeholders have argued that projects should put safeguards in place to mitigate the risk of nonpermanence.⁵³ Others argue that the moment a user decides to not burn a given quantity of fuel, the decision results in permanent avoidance of fuel combustion and so the permanence of the carbon credits generated from that activity is not a relevant concern. In addition, fNRB calculations incorporate some permanence risk by accounting for the balance between tree offtake and regeneration, thereby only generating emission reductions from the biomass that would not have regrown without the project activity. This issue is set to receive clarification by the UNFCCC's Supervisory Body for CDM activities transitioning to Article 6.4, although the Supervisory Body is gauging how material an impact the non-permanence risk is on the atmosphere.⁵⁴

Double counting. This can occur when the project area of a forest protection project overlaps with an area that is also "protected" by a clean and improved cooking carbon project. In this scenario, both projects would be claiming to have reduced emissions from the same forest area. Acknowledging this risk, some rating agencies have started assessing overlapping claims in evaluations of their clean and improved cooking carbon projects.⁵⁵



Technical assistants test clean cookstoves.

© Bhumesh Bharti / Clean Cooking Alliance

Ensuring sustainable development benefit claims materialize

Evidence shows that the shift to clean and improved solutions has tangible and measurable positive impacts on a wide range of environmental and social outcomes. Conventional cooking methods in developing countries largely still depend on open fires or rudimentary, inefficient cookstoves using solid fuels. This releases harmful pollutants that damage health and contributes to unsafe environments, putting families at risk. The negative impacts extend beyond the kitchen, affecting the ability of children and women to attend school and generate income due to the time it takes to collect biomass fuels.⁵⁶

The contribution of these sustainable development benefits by clean and improved cooking activities has been an important driving force of buyer demand for clean and improved carbon credits. By procuring carbon credits from clean and improved cooking carbon projects, buyers may not only use the compensation claim against their GHG emissions but can also claim contributions to a range of SDGs. Examples of commonly claimed co-benefits from clean and improved cooking carbon projects are improved health (SDG 3), affordable and clean energy (SDG 7), and responsible consumption and production (SDG 12).⁵⁷

“There aren’t many incentives for project developers to monitor and report their contribution to the Sustainable Development Goals in more robust ways.”

– Carbon credit rating agency, sharing their views as part of the RCF4CCI

An issue therefore arises when some claimed co-benefits do not actually materialize or are durable, especially when premium carbon prices are offered on the expectation that sustainable development benefits will be delivered. Looking at the impact on respiratory health, for example, it is documented that reduced exposure to smoke inhalation can have significant benefits for the women and children who spend the most time near the hearth.⁵⁸ But not all cookstove technologies are able to burn biomass at a high enough efficiency to yield health benefits, and households may continue to use their baseline stove alongside the project stove. In the absence of clear SDG reporting guidelines, carbon credit buyers and investors find it challenging to identify the highest-quality projects that can deliver greater SDG impacts than others. This triggers the need to further improve guidelines around the measurement of SDG contributions and the nature

of the claim that buyers can get from supporting high-impact clean and improved cooking carbon projects.

Improving the monitoring of sustainable development benefits

Monitoring sustainable development benefits is a difficult and costly endeavor. It is often resource-intensive for a project to establish a causal chain from activity to SDG impact, and it is difficult to establish and quantify benefits when clear methodologies are not readily available.⁵⁹ Adopting robust monitoring methodologies and verifying all sustainable development benefit claims result in increased monitoring costs that make financial sense only if carbon credit buyers recognize the effort and impact. Furthermore, project developers may propose their own approaches to monitoring SDG impacts⁶⁰ — or not monitor them at all but still claim impacts — risking the credibility and comparability of reported impacts across projects.

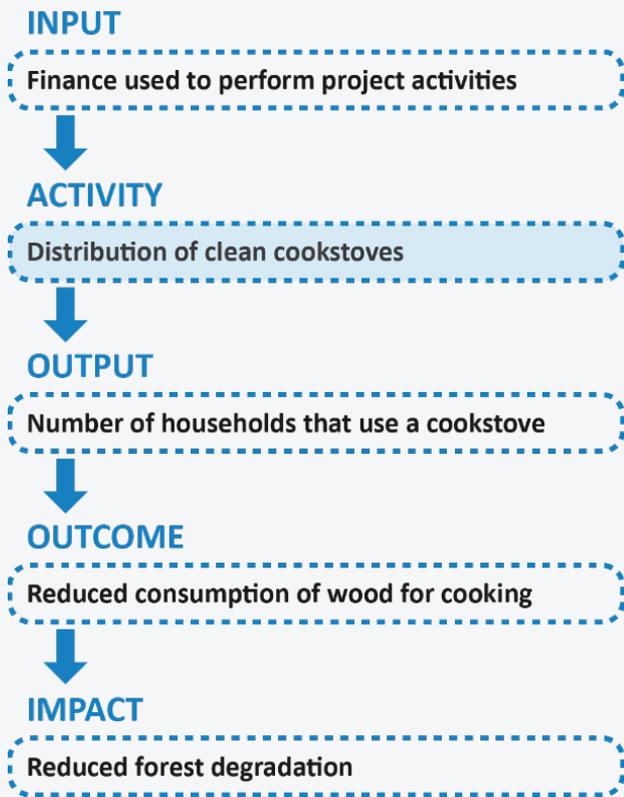
Existing monitoring approaches are also ineffective at differentiating between the magnitude and duration of SDG impacts, making it difficult for high-impact projects to stand out. For example, in the current carbon market, a project that generates employment for 1,000 individuals would not be differentiated from a project generating employment for only 10, and a project improving indoor air quality for the duration of a project’s crediting period will be given as much recognition as a project that continues to have a positive impact on air quality beyond the crediting period.

“If buyers want to claim contributions to co-benefits materializing, they need to be willing to pay for the extra effort needed in certifying these.”

– Project developer, sharing their views as part of the RCF4CCI

While concrete changes at the activity level can be effectively monitored (Figure 3), they may not always yield the intended positive outcomes. For example, impacts on health outcomes could be hindered by persistent stove stacking or simply continuing to cook in enclosed areas without ventilation. Existing monitoring approaches do not track household energy consumption, making it difficult to determine an activity’s sustainable development benefit contribution with certainty.

FIGURE 3
Example of a causal chain of events from input to impact for a clean and improved cooking project.



Difficulty in measuring SDG impacts is not an issue unique to clean and improved cooking carbon projects. At the same time, it should be recognized that accurate measurement of SDG contributions is a challenging space beyond the confines of carbon markets. The UN recognizes that significant gaps persist in our data landscape, which fluctuates considerably in terms of geographic coverage and timeliness. This makes disaggregation of results and progress toward meeting global SDG commitments challenging. For several cross-cutting goals such as climate action (SDG 13), gender equality (SDG 5), and peace, justice, and strong institutions (SDG 16), less than half of the 193 countries reporting to the UN have internationally comparable data. Furthermore, less than 30% of the reporting countries offer the latest available data from 2022 and 2023, highlighting the challenges in the delivery of timely data.⁶¹ This stark reality serves as a reminder that carbon project developers need to be guided through their journey of measuring the broader sustainable development benefit contributions of their projects, and that buyers and investors should reward activities that pursue best practices available today.

ONGOING EFFORTS TO IMPROVE SUSTAINABLE DEVELOPMENT BENEFIT REPORTING AND CLAIMS

Several ongoing efforts seek to address the limited capacity of carbon market actors to effectively measure sustainable development benefits. Some of these developments specifically target the clean and improved cooking sector. Existing initiatives can broadly be categorized as follows:

- **Guidance initiatives.** The ICVCM’s Core Carbon Principles introduce distinct provisions on sustainable development benefits and safeguards, requiring carbon-crediting programs to ensure mitigation activities provide information on consistency with host country SDG objectives, how any SDG benefits are delivered, and what standardized tools or methods are to be followed by carbon project developers. Several additional attributes are also presented on top of the standard Core Carbon Principles label, one of which relates to “Quantified positive SDG impacts,” and signal the importance of accurately measuring sustainable development benefits of carbon credit projects.
- **Carbon standard guidelines.** Leading carbon standards have expanded their guidance on co-benefit monitoring and reporting in recent years. The UNFCCC Secretariat is developing an SDG Tool for Article 6, which would give priority to the sustainable development objectives of the host country.⁶² Another example is the Gold Standard for the Global Goals,⁶³ which has introduced a tool to streamline SDG impact monitoring⁶⁴ and has developed a methodology to estimate Averted Disability Adjusted Life Years (ADALYs).⁶⁵ Verra, in turn, has launched the Sustainable Development Verified Impact Standard (SD VISTA) and is in the process of developing a methodology to measure time savings from cleaner cooking.⁶⁶ Another example is W+ Standard, a certification scheme by Women Organizing for Change in Agriculture and Natural Resource Management (WOCAN), which measures how initiatives can drive economic and social empowerment for women.
- **Comparative project evaluation.** Reflecting the market’s interest in sustainable development co-benefits and the availability of SDG certification protocols as mentioned above, carbon credit ratings agencies are also looking beyond evaluating the climate integrity of carbon credits. Calyx Global⁶⁷ is one example of a ratings agency that provides an SDG impact rating for carbon projects that have received SDG certification through Verra’s SD VISTA

or the Gold Standard for the Global Goals. Both the depth and durability of SDG contributions are evaluated. Calyx Global's approach thereby also aligns with the ICVCM's recommendations to distinguish carbon credits that can deliver verifiable sustainable development benefits.

- **Donor programs.** The development community is supporting efforts that improve transparency and robustness of sustainable development co-benefit contributions of clean and improved cooking activities. One example is the Energy Sector Management Assistance Program administered by the World Bank, which is researching how to provide sound data on gender and health impacts of clean and improved solutions alongside partners BIX Capital, Cardano Development, and Sistema.bio. The study is under development and seeks to determine the extent to which there is demand for non-carbon benefits and the type(s) of buyers that could be interested in these benefits.⁶⁸

However, significant heterogeneity remains in the approaches that projects take to determining co-benefit impacts. Impacts such as health benefits are not always well substantiated, and project developers are free to make the claims they wish in their marketing materials. For those projects that choose to certify sustainable development benefits, carbon standards have only recently begun to be prescriptive about the type of evidence needed to confirm a given benefit claim.

Transparency

Noncommercially sensitive information on carbon markets is accessible.

Transparency is essential to ensuring a market that operates without overly distorting local clean and improved cooking markets, and to enabling fairness in the distribution of carbon revenue.

One *Principle* addresses this transparency concern:

- T1: The monetary and/or non-monetary benefits reaching the project and technology/fuel users are transparent within a given transaction.

Ensuring transparency in monetary and non-monetary benefits shared

Transparency can help strengthen fairness and integrity. Enhancing transparency is widely regarded as a top priority for ensuring fairness and integrity in the carbon market. There was strong consensus among the Responsible Carbon Finance for Clean Cooking Initiative Working Group participants⁶⁹ that more transparency is needed on how revenue is distributed along the value chain. Transparency was the characteristic most often cited of what a fair, clean, and improved cooking carbon market would look like.

Limited information on carbon prices and revenue distribution makes it difficult for buyers to know whether they are paying a fair price. Research indicates that companies are hesitant to finance climate action beyond their value chain if they are unsure how the money they are investing is used.⁷⁰ This is reflected also by the working group participants, with investors indicating that greater transparency in how revenue is used would increase their confidence in investing in clean and improved cooking carbon projects.

“Organizations are not transparent about where carbon revenues are used.”

– Project developer, sharing their views as part of the RCF4CCI

The lack of pricing information is not unique to carbon markets. Research into transactions in the carbon market shows that only 10% of intermediaries that buy and sell voluntary carbon credits disclose their commissions and profits.⁷¹ While these findings relate to the voluntary carbon market generally, this reality is also observed in the clean and improved cooking sector. Some market actors are countering this trend, committing to disclose their fee structures and the prices of the carbon credits they sell (Table 3). However, the larger intermediaries such as Carbon Trade eXchange do not publicly disclose their fee structure, and pricing remains accessible only to members. Even where the fee structures are disclosed, data on the monetary and/or non-monetary benefits that ultimately reaches the project developer or owner is rarely provided.

TABLE 3

Examples of information disclosed by online carbon credit marketplaces, selected because they disclose fee information.⁷²

NAME	INFORMATION DISCLOSED
<p>Plannet Zero</p>	<p>A subsidiary of Redshaw Advisors, Plannet Zero serves more than 300 companies with environmental market compliance and carbon offsetting services. Fees for reselling are capped at 15%.</p> <ul style="list-style-type: none"> The prices of carbon credits are displayed. For example, the price of carbon credits from the Proyecto Mirador ICS project for Central America is listed at GBP 9.53 per carbon credit.
<p>Gold Standard Marketplace</p>	<p>Run by the Gold Standard to retail carbon credits certified by its standard.</p> <ul style="list-style-type: none"> 15% of proceeds are retained to cover administrative costs, service charges, and variable exchange rates. Minimum carbon price is calculated based on the Fairtrade Carbon Credits pricing model. Prices for specific projects are listed, e.g., credits from the Qori Q'oncha Improved Cookstove program are listed at US\$ 25 per carbon credit.

Of course, there are valid arguments for not publicly sharing all data relating to transactions. Some data may be commercially sensitive or subject to confidentiality obligations. Information on the monetary and/or non-monetary benefits reaching the project could, though, be shared with actors within the value chain of a given transaction.

ONGOING EFFORTS TO DELIVER GREATER TRANSPARENCY

Carbon market actors recognize the risks that opacity in carbon credit pricing and revenue distribution presents to the market and have started initiatives to improve transparency. While the initiatives are based on the general carbon market, they also address transparency issues specific to clean and improved cooking carbon projects. These include:

- **Certification schemes.** The Fairtrade Climate Standard pricing model supports transparency in pricing by setting a minimum price for credits and by providing buyers with information on how carbon revenue is used (see Fairness section for a discussion on the Fairtrade pricing model). This is useful information for buyers, though additional costs associated with Fairtrade credits have created challenges in scaling their uptake.⁷³
- **Guidance initiatives.** The ICVCM’s next iteration of the Assessment Framework (expected to be released in 2025) may set out requirements on communicating how revenue is used and managed for the purpose of benefit sharing. Additionally, the

ICVCM intends to create a work program to improve market transparency through the disclosure of credit pricing, the establishment of tracking systems, and the provision of guidance for revenue reporting.⁷⁴ The effectiveness of these requirements will depend on how many carbon standards subscribe to them.

- **Exchange platforms.** The emergence of exchanges is also enhancing the process of price discovery within the VCM as transactions move away from the opaque over-the-counter bilateral market. Through the establishment of standardized contracts whose prices are fully disclosed, exchanges such as [CBL Xpansiv](#), [Climate Impact X](#), and [AirCarbon](#) seek to amplify transparency within the VCM. In October 2022, CBL Xpansiv launched a standardized contract, the Sustainable Development Global Emissions Offset, designed for carbon credits. This contract aims to simplify the purchasing process for buyers by enabling price discovery and ensuring the acquisition of high-quality carbon credits.⁷⁵ Futures exchanges have also stepped into this arena, introducing forward price discovery and liquidity for the carbon credit market.⁷⁶
- **National regulation.** Some jurisdictions are also considering mandatory requirements for companies to disclose the quantity and costs of carbon credits used for offsetting. In the European Union, the Commission has adopted the European Sustainability Reporting Standards, which will require disclosure on companies’ use of credits and their quality.⁷⁷ The U.S. Securities and Exchange

Commission (SEC) also consulted on its proposed rule⁷⁸ containing mandatory climate reporting for listed companies, which includes disclosure on quantity and type of credits used. While the EU proposal does not include the disclosure of prices, the proposal in the United States would require companies to disclose the costs and quantity of the carbon credits used, which would then indicate prices.

Fairness

Carbon projects solicit informed consent from users and share revenue fairly along clean and improved cooking value chains.

The carbon market for clean and improved cooking activities — and the resulting delivery of carbon finance — has experienced exceptional growth in the past few years, although this growth has now stalled. A typical carbon market transaction involves several entities, and carbon revenue does not always pass

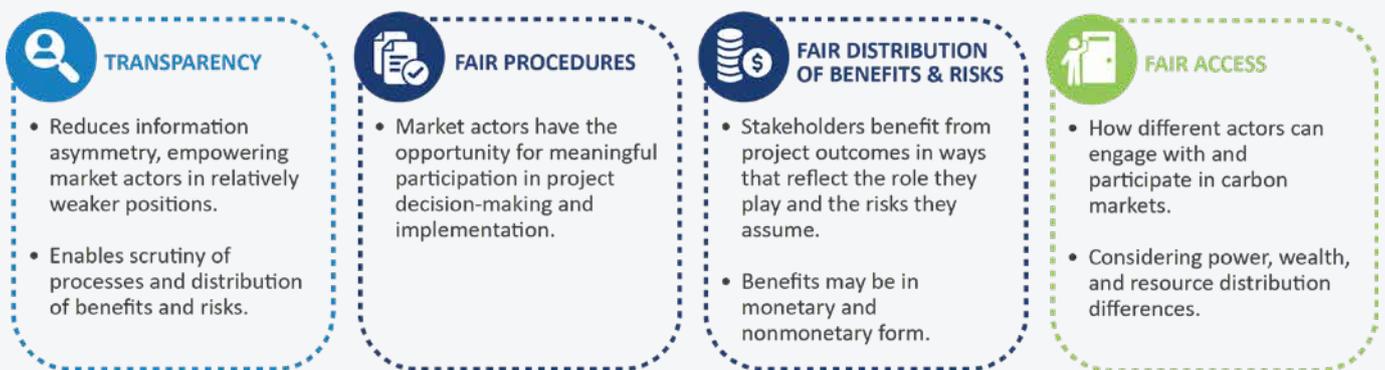
directly from the end buyer to a project developer with boots on the ground. Even when this does occur, the distribution of carbon revenue to technology users is rarely clear. Questions therefore arise as to the fairness of the processes through which projects are developed and the way in which benefits are shared among those involved. Working group participants identified that ensuring fairness is a critical factor in ensuring carbon credit buyer confidence.

“Current narratives forget what carbon markets are for: to transfer finance to low- and middle-income countries.”

– Project developer, sharing their views as part of the RCF4CCI

Fairness is a multifaceted concept and can be subject to a range of interpretations. In the context of carbon markets, there are four aspects of fairness (Figure 4), and research is often centered around three areas: fair processes, fair benefit sharing, and fair access to the market.⁷⁹

FIGURE 4
The four pillars of fairness.



Discussions of fairness in carbon markets have largely centered on forest and land-use projects, and understandings of how to ensure that projects are fairly implemented are therefore more advanced in these sectors. While some of these understandings can apply to clean and improved cooking carbon projects, there are important differences between the two project types. For one, land-use projects have a clearly defined community. This boundary is harder to define for cookstove projects; the household is the logical unit, and neighbors may not have a clean and

improved cooking solution. Secondly, land-use projects often restrict the ways in which communities can use the land that they traditionally own and manage, whereas clean and improved cooking carbon projects do not involve restricting existing rights. In addition, communities affected by a land-use project may stand to lose out economically by prohibiting the sourcing of resources from local forests, while cookstove users immediately benefit from access to clean and improved cooking technologies by way of monetary savings and cleaner indoor air. There is, therefore, a need to

develop what “fairness” means in the context of clean and improved cooking carbon projects, rather than adopting how the word is defined in other carbon project types.

Two Principles address this fairness concern:

- F1: Informed consent precedes each user’s participation in a carbon project.
- F2: Carbon revenues are shared by all stakeholders in a way that is proportionate to the risk they assume and the value they create.

Ensuring fair processes in project participation

All carbon standards require some form of stakeholder engagement. All carbon standards require projects to involve communities through the local stakeholder consultation process before validation. The consultation process is a way to “inform the design of the project” so stakeholders can evaluate the impacts of the project and provide input on the project design.⁸⁰

A key tenet of consultations is obtaining the free, prior, and informed consent (FPIC) of households or communities regarding their participation in clean and improved cooking carbon projects. While most often discussed in the context of land-based carbon projects, some of the principles of FPIC can be applied to clean and improved cooking carbon projects. The World Bank defines FPIC in clean and improved cooking carbon projects as:

Consent is required in addition to consultation; that it be given in the absence of coercion or manipulation; that it occurs sufficiently in advance of planned activities; and that it be based on satisfactory information in an appropriate format, including costs and drawbacks in addition to anticipated benefits.⁸¹

FPIC is especially relevant when households formally agree to participate in projects and sign contracts transferring their carbon rights to project developers. It implies that households should have sufficient information to understand the contracts, including the item they are transferring, its value, what they receive in return, and any other obligations they assume. Fully understanding contracts might also imply that cookstove users understand revenue expectations, how the revenue is used, and what portion of the

revenue they will receive (either directly or indirectly through subsidized stoves, free maintenance, or other nonmonetary benefits).

Guidance could be improved to help project developers to better inform households about the carbon waivers they are asked to sign. The concept of carbon credits is relatively abstract, and several project developers we spoke to indicated that many households do not fully understand what they are signing over when they agree to transfer carbon rights to project developers. Contracts are also sometimes overly legalistic or complex, making them difficult for households to fully understand. Project developers rarely disclose to households the revenue they obtain and what portion of the revenue is given to the households.⁸²

ONGOING EFFORTS TO FOSTER FAIRER PROJECT PARTICIPATION

Several ongoing efforts seek to promote meaningful involvement of project participants and broader communities. These initiatives can broadly be categorized as follows:

- **Carbon standards’ requirements.** Carbon standards require project developers to conduct stakeholder consultations.⁸³ The Gold Standard provides more extensive guidelines and requirements for engagement of local communities than Verra’s VCS and other standards. For instance, the Gold Standard provides guidelines on who the key stakeholders are and places emphasis on ensuring that marginalized groups and indigenous communities are involved. Project developers are required to transparently identify stakeholders, ensuring that affected and interested parties are taken into consideration and that consultations take place. Moreover, project developers are invited to identify potential obstacles that hinder participation in consultations and establish a grievance mechanism that allows stakeholders to provide feedback on the project during its operation.⁸⁴ Another key requirement under the Gold Standard and other carbon standards is proof of ownership of carbon credits. As part of proof of ownership, project developers are required to demonstrate that any transfer of ownership was done transparently and with full, prior, and informed consent.⁸⁵ However, as described above, these requirements are often not fully realized.

■ **National regulation.** Governments also have adopted or are in the process of adopting measures to ensure fair processes, particularly with regard to community participation. For instance, Kenya is implementing a bill to regulate carbon markets within its national territory. The Climate Change (Amendment) Bill provides that projects should be implemented through community development agreements that must outline how affected communities will be engaged throughout the project. Zimbabwe’s Carbon Credit Framework requires that communities and other stakeholders effectively participate and are enabled to make informed decisions regarding carbon trading initiatives. In Tanzania, carbon market regulations require project proponents to facilitate, develop, and strengthen the capacity, awareness, and participation of stakeholders in carbon projects.⁸⁶ Project proponents are further required to provide relevant information on their projects to local communities and to involve them in planning, implementation, and monitoring processes.

Ensuring fair risk-reward revenue and benefit sharing

The portion of carbon revenue reaching the ground in part determines the price buyers pay. Clean and improved carbon credits typically command a price premium over other credit types, with buyers willing to pay more due to the benefits for households that clean and improved cooking carbon projects promise. However, if buyers are not confident that what they are paying is actually reaching those on the ground, they are less likely to be convinced of the added value of a clean and improved carbon credit. Indeed, most working group participants rated project costs, SDG benefits, and the proportion of revenue that goes to communities or households as important factors in determining the price that buyers are willing to pay for carbon credits.

Intermediaries deliver important services to project developers and buyers, and they claim a relatively large share of carbon revenue in exchange. There is

currently limited transparency regarding the prices paid for carbon credits at different points in the value chain and how revenue earned by projects is used. There is nonetheless a widespread perception that a large share of carbon credit revenue is captured by resellers, traders, aggregators, brokers, exchanges, and other intermediaries. These intermediaries play an important role in carbon markets. Most of the project developers taking part in the working group discussions reported relying on these actors to facilitate at least some of their sales. While some believe the share of revenue captured by intermediaries is proportionate to the value they add and the risks they assume, most market actors are either uncertain or believe it is not justified.⁸⁷ Cases were cited where smaller project developers received less than half of the final price paid by end buyers.

Ensuring a fair market requires that the fees or markups retained by intermediaries are proportionate to the value they add and the risks they assume. This amount will vary depending on the role intermediaries play as well as market conditions. For instance, it is reasonable to expect investment funds or other intermediaries that provide upfront finance for project costs or enter into forward contracts to seek higher returns than brokers who simply facilitate spot transactions, since the former assumes more risks than the latter. Even where intermediaries do assume risks, margins that are deemed excessive or are seen to be exploiting an intermediary’s relatively stronger position vis-à-vis project developers risk diminishing confidence in the fairness of the market.

Figure 5 provides an illustrative example of how revenue earned from sales of clean and improved carbon credits is currently distributed through the value chain. Due to the opacity of the market, however, there is insufficient data to more precisely quantify how much revenue each actor receives.

“It is ideal for the cookstove user to share in revenue benefits, but it is not always practical. For users, most relevant is affordability of the technology and usability of the stove.”

– Project developer, sharing their views as part of the RCF4CCI

FIGURE 5

A large portion of carbon revenue earned by clean and improved cooking activities tends to stay with actors further up the value chain. Figure is illustrative only.



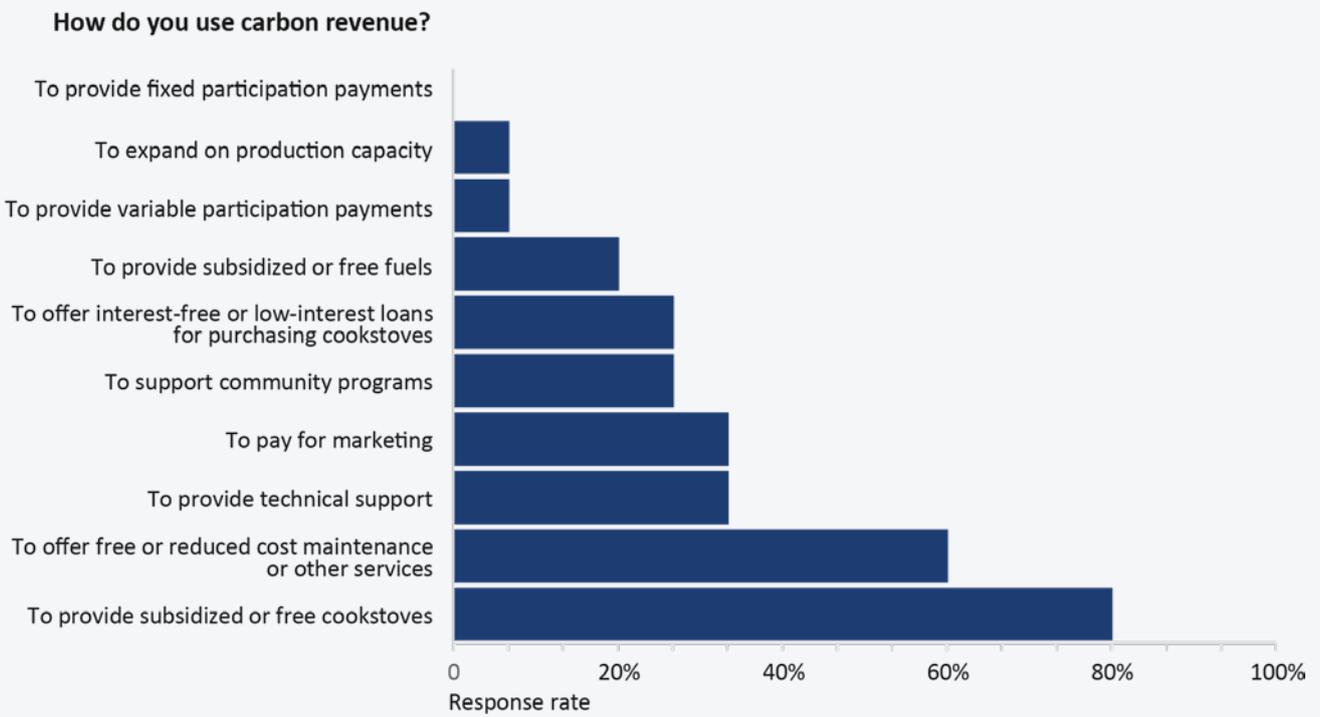
Revenue sharing can take the form of monetary and nonmonetary benefits. Ensuring fairness also requires that the revenue that is generated by each project is fairly distributed among those who participate in the project. In addition to the project developers themselves, this includes the technology or fuel users — whose use of these products ultimately generates carbon credits — as well as local implementers, cookstove manufacturers, and the broader community. Such revenue distribution can take place through both monetary and nonmonetary means. While local implementers will typically be paid in monetary terms, technology or fuel users rarely receive cash payments. Projects most commonly provide subsidized or free technologies/fuels, with many also offering free or reduced-cost maintenance (Figure 6). Some also provide funding for community programs or low-interest loans.

However, any benefit sharing must not bankrupt the project by pulling too much revenue away from its operation; a project is healthy only when it is well resourced to deliver on its core purpose.

At present, there is no single guide for determining what fair revenue sharing with technology/fuel users and communities looks like. Programs seeking to increase fairness are developing their own approaches to fairness and revenue sharing with technology users. Where carbon credit prices are low or project costs are high (for instance, when projects take place in remote areas), it may not be feasible to offer benefits beyond subsidized cookstoves and maintenance. More expensive cooking solutions such as domestic biogas digesters also require larger subsidies, which can reduce room for additional incentives. Nonetheless, emerging carbon credit revenue-sharing programs highlight the potential of innovative technology to strengthen fairness in the clean and improved cooking sector, as exemplified by a recent collaboration between ATEC, FairClimateFund, and MECS (Box 4).

FIGURE 6

Survey responses reveal that most clean and improved cooking carbon projects use carbon revenue to provide subsidized or free cookstoves and/or to offer maintenance or other services.



BOX 4

Case study: ATEC, FairClimateFund, and MECS collaborate on carbon credit sharing in Cambodia and Bangladesh⁸⁸

In August 2023, ATEC, FairClimateFund, and MECS united to pilot an innovative carbon credit revenue-sharing initiative based on verifiable usage data. The pay-per-use approach is enabled by ATEC’s Internet of Things (IoT) stoves to financially incentivize the adoption of clean and improved cooking solutions in Bangladesh and Cambodia. Through dynamic real-time usage data, this initiative enables carbon credit micropayments directly into the mobile money accounts of participating households. As FairClimateFund facilitates the sale of these carbon credits to companies committed to fostering climate action, the project aims to encourage the sector to value households for their efforts as front-line contributors to carbon dioxide reduction. Key to this initiative are the preestablished minimum price and target price agreed upon between the FairClimateFund and ATEC to enable 70% of the purchase price to directly reach the users as a mobile payment while the remaining 30% is set to cover credit generation costs incurred by ATEC. The carbon credits, which are issued under the Gold Standard methodology, are generated by real-time monitoring, reporting, and digital verification.

Preliminary results indicate that paying new customers for their usage increases technology adoption by up to 56%, although the effectiveness of paying existing customers is lower and dependent on the country.⁸⁹

Conversely, where projects command higher prices for their credits and are making healthy profits, there is a strong case for ensuring that a greater share reaches those on the ground. Our research indicates that buyers are willing to pay more for credits from projects that direct a greater share of revenue to technology users.⁹⁰ For example, many are in favor of direct payments based on stove usage. This would provide an incentive to use efficient or clean stoves more frequently, though it would also require monitoring stove usage at the household level, which is not always possible.

Technology users could also be provided with a share of profits, which would provide more security to project owners that costs are met before payment obligations kick in. Other options include dedicating funding to projects that benefit the community at large, such as investing in education, training, or health care. No matter the approach chosen, greater transparency on benefit sharing would help to incentivize a “race to the top,” making these programs more attractive to carbon credit buyers.

“Country governments should benefit from the carbon projects they host. Revenue raised should ideally be plugged back into climate projects.”

– Project developer, sharing their views as part of the RCF4CCI

Governments are increasingly expecting a share of carbon revenue. Governments are a final stakeholder that is increasingly expecting a share of carbon credit revenue. Zimbabwe,⁹¹ Tanzania,⁹² and Kenya⁹³ have all proposed or adopted regulations under which governments would levy specific fees, taxes, or royalties on carbon projects and credits. However, not all of these apply to clean and improved cooking carbon projects. For instance, Tanzania’s Carbon Trading law sets out specific percentages to be allocated to the government in the case of land-based projects, while for other types of projects percentages will be negotiated between the government and the project owners.

While it is common for governments to charge certain taxes and fees on commercial activities in their territory, very high taxes or fees can disincentivize investment and leave less revenue for distribution to communities. It is therefore important that governments carefully consider the level of charges they wish to apply and consult with relevant stakeholders in making these decisions. Given the scale of the lack of access to clean and improved cooking solutions and the significant benefits these clean and

improved cooking carbon programs can bring directly to households — especially women and children — governments could consider offering tax breaks to enable the clean and improved cooking sector to better attract international financing.

ONGOING EFFORTS TO IMPROVE BENEFIT SHARING

Several existing initiatives seek to ensure that projects receive fair prices and that communities receive a fair share of carbon revenue. These initiatives can broadly be categorized as follows:

- **Carbon standards’ requirements.** The Fairtrade Climate Standard⁹⁴ provides a minimum price for Fairtrade Carbon Credits, ensuring that projects receive a price that can cover costs and provide significant investment in local interventions. In addition, a fair-trade premium is paid by the buyer, which is ringfenced for investment in local adaptation projects. Another example — although outside of the clean and improved cooking sector — is Plan Vivo,⁹⁵ which requires that 60% of revenue from every carbon credit go directly to the participants in its land-based projects, including farmers and community groups like farmer cooperatives, women’s groups, and community trust funds. Both standards, however, remain small in terms of credit issuances (less than 1% of issuances).⁹⁶
- **Project’s own initiative.** There are several project developers — primarily nonprofits — who are seeking ways to increase benefit sharing with technology users and the communities in which they work. This can include setting up local manufacturing facilities to generate local employment,⁹⁷ establishing a fund for community support,⁹⁸ or committing to direct revenue sharing with technology users. For example, the Fair Climate Fund⁹⁹ offers buyers Fairtrade Carbon Credits from clean and improved cooking carbon projects. It addresses fairness of benefit sharing by requiring that local households own the Fairtrade Carbon Credits, which they use to pay off their cookstoves. They also ensure that 50% of revenue reaches cookstove users in the form of monetary payments, and/or technology subsidies to either bring down the cost of the stove or to finance repairs.
- **National regulation.** Some host country governments are also beginning to regulate carbon credit pricing and benefit sharing. Kenya’s draft

Carbon Credit and Benefit Sharing Bill would allocate specific percentages to communities, although initial drafts mostly focused on land-based projects.¹⁰⁰ Tanzania’s national carbon trading regulations require that carbon trading projects that are not managed by communities explicitly show how local communities will benefit from the projects. There are also demand-side efforts linked to the carbon market to encourage revenue sharing with local stakeholders. For example, Dutch government procurement policies provide incentives to projects that compensate carbon emissions using Fairtrade Carbon Credits or those with Gold Standard or Climate, Community & Biodiversity (CCB) Standards certification.

- **Market initiatives.** Several initiatives seek to reduce project developers’ reliance on intermediaries, allowing more of the carbon revenue to be retained by project developers. For instance, the Africa Carbon Markets Initiative (ACMI)¹⁰¹ aims to support the development of African exchanges and marketplaces, and generate advanced market commitments from buyers and facilitating actors, which would allow project developers to connect directly with buyers and avoid going through intermediaries.

Sustainability

Carbon markets complement other forms of funding and do no long-term harm to local clean and improved cooking markets.

There is broad consensus that the clean and improved cooking sector requires much more investment to achieve universal access by 2030 as specified in Sustainable Development Goal 7 (SDG 7).¹⁰² Carbon finance is a major source of revenue for project developers but is not sufficient to achieve the scale necessary to provide clean and improved cooking solutions to the billions of people who lack access. Other sources of funding for the clean and improved cooking sector are also needed, including official development assistance (ODA)¹⁰³ and philanthropic capital, which offer payments to interventions that improve health, reduce environmental impacts, or promote gender equity. When a project benefits from multiple sources of finance, it is important to ensure that the finance provided is complementary to one another to ensure the optimal use of public and private finance and to avoid overly distorting national clean and improved cooking markets.

To attract international carbon financing that allows national carbon markets to grow, an enabling regulatory environment is essential. Uncertain and volatile return trajectories make investing in carbon markets a risky endeavor, which when coupled with uncertain national regulatory environments can scare off investors and financiers entirely. Some host country governments have started to regulate carbon market transactions or have stated plans to do so. Where these create an unmanageable financial strain on clean and improved cooking carbon projects or are implemented with little prior lead time or grandfather clauses (e.g., when an entity is offered a concession because its decisions were made under previous regulation), it is likely that these will serve to disincentivize much-needed investment in clean and improved cooking.

Three Principles address these sustainability concerns:

- S1: Carbon finance, official development assistance and philanthropic capital are complimentary.
- S2: The positive effects of carbon finance on clean and improved cooking markets are promoted, while excessive market distortions are avoided.
- S3: National policies facilitate the development of clean and improved cooking carbon markets.

Ensuring carbon finance and other sources of funding are complementary and avoid excessive market distortions

Multiple sources of funding must be complementary. Complementarity in markets refers to “an activity in one sector that produces activity and income in another sector.”¹⁰⁴ In the context of clean and improved cooking activity, complementarity is relevant because it addresses the extent to which multiple sources of funding, such as ODA, philanthropic funding, and other public investments (including climate finance not directly linked to the generation of tradeable carbon credits) interact with carbon markets. These interactions can be positive and synergistic. For example, funding can help develop the elements of the clean cooking ecosystem that carbon finance is not well placed to support.

Moreover, while these additional sources of finance are welcome and needed, complications arise when coupled with carbon finance *after* non-carbon finance has already been awarded. First, carbon finance could end up duplicating the efforts of results-based

financing facilities when success is measured by the number of cookstoves delivered. This could ultimately waste scarce public resources and cast doubt on whether projects need carbon revenue to operate. Similarly, ODA, while not linked to specific quantifiable development outcomes, could have the same effect if applied in an uncoordinated way.

Second, if multiple sources of funding are applied in an uncoordinated way, there is a risk of unintended consequences. For example, carbon finance is often used to subsidize stoves or fuels, so that cleaner technologies are more affordable for technology users than baseline options. By design, these subsidies distort the market in a desirable direction because they increase the provision of public goods like health and environmental benefits, leaving society better off overall. Indeed, in some circumstances, such as providing access to clean and improved cooking stoves for free (i.e., a 100% subsidy) to refugees, internally displaced populations, or other extremely marginalized or remote groups may be justified. However, multiple, poorly coordinated sources of funding can be counterproductive by duplicating efforts, introducing undesired market distortions, creating windfall profits for some project developers at the expense of others, or leading to inefficient use of (public) resources.

ONGOING EFFORTS TO PROMOTE COMPLEMENTARITY AND ADDRESS MARKET DISTORTIONS

There are several examples of funding programs that are designed to work alongside carbon financing. Not all of these are designed to avoid market distortions, but they do demonstrate how public and philanthropic finance can be used to complement carbon finance and ensure efficient use of these funds. These can broadly be categorized as follows:

- **Dedicated investment funds.** In recognition of the fact that clean and improved cooking companies are facing challenges in their quest to access carbon capital, several dedicated investment programs are being deployed to help project developers overcome access to finance barriers. Examples of these include:
 - **Spark+ Africa Fund:** This dedicated impact fund invests solely in cooking energy solutions in developing markets. It invests debt and mezzanine capital in leading companies throughout the value chains of various cooking fuels including LPG, biofuels such as ethanol and pellets, electric

appliances, and efficient biomass stoves.¹⁰⁵ The fund was initiated by the Clean Cooking Alliance, Enabling Capital, and Stichting Modern Cooking. In its first close, Spark+ Africa raised over US\$ 40 million through capital from development finance institutions and foundations.¹⁰⁶

- **Clean Cooking Alliance Venture Accelerator:** The CCA is launching a venture accelerator to support small and growing clean and improved companies to increase the likelihood for these enterprises of securing access to carbon finance. The program will build the operational and strategic capacity of these businesses to develop high-quality projects that are better integrated into country-level planning for clean and improved, carbon finance and, where applicable, international carbon markets. The first support window of the accelerator program will assist high-potential clean and improved cooking companies with promising technology to unlock their carbon market potential in the West African region.¹⁰⁷
- **Partnership Platform for Clean Cooking Finance:** This partnership, initiated by the Clean Cooking Alliance, Africa Guarantee Fund, and United Nations Capital Development Fund, seeks to leverage carbon markets by providing finance to de-risk investments in clean and improved cooking markets.¹⁰⁸ The platform will pool the capabilities of different stakeholders in the financial ecosystem to enable developers of clean and improved cooking carbon projects to access a wider range of capital options and help financiers when considering new investments.
- **Adjusted contracting obligations.** The major funding agencies offering results-based financing are aware of the risks associated with multiple funding streams seeking to support clean and improved cooking to achieve separate but interrelated development outcomes and have started taking measures to prevent excessive funds from going to specific actors to both ensure funding efficiency and avoid excessive market distortions. For example, Nefco's guidelines for its Modern Cooking Facility for Africa (MCFA) include a clause stating that Nefco has the right to "reduce any undisbursed MCFA1 incentives should carbon finance render this excessive from a financial sustainability point of view."¹⁰⁹ However, results-based funders concede that it is difficult to implement this policy and that withdrawing funding could do more harm than good.¹¹⁰ To avoid this, results-based financiers could focus on funding

early-stage clean and improved cooking companies, which may have trouble accessing other sources of finance during startup, before they generate revenue from stove and carbon credit sales.

- **Supporting clean cooking ecosystem.** More general forms of ODA could also complement carbon finance by supporting the clean cooking ecosystem. For example, by building technical capacity among government personnel and verification organizations, supporting the development of stove and fuel standards, building essential infrastructure for clean fuels like ethanol or LPG distribution networks and last-mile electrical grid upgrades, or providing loan guarantees so that riskier ventures need not rely on commercial lenders. For example, the Climate and Clean Air Coalition (CCAC) is supporting Uganda to build a more enabling environment for clean and improved cooking that includes key ecosystem components such as standards for clean stoves; regulations for polluting fuels; monitoring, reporting, and verification frameworks; and capacity building.¹¹¹

Some initiatives specifically **aim to avoid excessive market distortions**, although these are uncommon. Examples include:

- **Dynamic subsidies and technology floor pricing.** The World Bank, a major funder of access to clean and improved cooking, aims to avoid excessive market distortions in their results-based schemes by implementing dynamic subsidies based on the price of the stove and defining a floor price below which stoves cannot be sold and still be eligible to receive a subsidy from World Bank.
- **Price transparency.** The initiatives supporting price transparency described in the Transparency section above apply here as well. The more transparency there is around the price point at which technologies are offered and how carbon financing is used to make these technologies affordable, the easier it will be to spot excessive market distortions. As those processes gain traction, the magnitude of subsidies supported by carbon finance and other sources of funding will become more apparent and pressure could be brought to bear on projects that are offering excessive subsidies.

Although some of the major funders in the clean and improved cooking space have introduced measures to reduce the risk that their investments could overlap with carbon finance, funding agencies concede that

the measures could be difficult to enforce. In addition, the term “excessive” is used to describe a level of subsidy that should be avoided, but a more accurate definition of what this constitutes is lacking. There are economic tools that could provide guidance about how to optimize subsidies for specific applications, but these tools are not readily accessible to nonexperts.¹¹² Further analysis is needed to guide stakeholders on the optimal level of subsidies.

Promoting regulatory clarity to deliver an enabling environment for investments in the carbon market

Unaccommodating regulatory environments negatively affect investment conditions. Regulatory environments that are unaccommodating harm investment conditions and can make clean and improved cooking carbon projects unviable from the outset. Unpredictable regulatory changes, meanwhile, can put existing business models of clean and improved cooking carbon projects in jeopardy. As countries grapple with how to deal with the implementation of the Paris Agreement and its accounting rules, a cloud of uncertainty looms over the market as national regulators adopt varying strategies to transition to the new climate regime.

While in principle the voluntary carbon market is governed by the private standards bodies that define the rules for the generation and issuance of carbon credits into their registries, the rules that govern international cooperation under these newly introduced Article 6 mechanisms open the door to carbon market transactions under the Paris Agreement that may overlap, integrate, or compete with voluntary market activities. The lack of clarity to date over the relationship between Article 6 of the Paris Agreement and the VCM has prompted uncertainty about carbon market engagement from investors, including in the clean and improved cooking space.¹¹³ This is slowing down the momentum behind the voluntary market, at a time when the Article 6 market is not yet operationalized.

Early actions by governments in response to the undefined relationship between Article 6 and the VCM point toward a rising tendency to regulate transactions in the VCM. Indonesia¹¹⁴ and Papua New Guinea¹¹⁵ temporarily halted international transactions of voluntary carbon credits, pointing to the lack of agreed carbon trading frameworks as a reason. Zimbabwe¹¹⁶

and Zambia¹¹⁷ are looking to introduce taxation of carbon revenue to redistribute resources. Kenya¹¹⁸ and other countries are introducing requirements for project developers to earmark a share of realized carbon revenue to local communities. While the introduction of such regulations is within the mandate of host countries and understandable in the context of nationally determined contribution (NDC) accounting under the Paris Agreement, abrupt changes in the rules of the game negatively affect investor confidence in specific sectors as well as in the broader carbon market.

“[Regulatory uncertainty] is by far and away the largest barrier of entry. It is complex and ever changing, adding already stretched risk profiles to the limit.”

– Investor, sharing their views as part of the RCF4CCI

Corresponding adjustments are a looming risk to the voluntary carbon market. Another uncertainty that the current market struggles with is the extent to which clean and improved cooking activities covered under the VCM will undergo “corresponding adjustments.” Making a corresponding adjustment means that when a party transacts an internationally transferred mitigation outcome (ITMO) to be counted toward another party’s NDC mitigation pledge, this mitigation outcome must be “un-counted” or withdrawn from the NDC mitigation efforts of the party that agreed to transfer it. While this seems straightforward, questions about how and when a corresponding adjustment should be applied remain contentious.¹¹⁹

Some market participants worry that carbon credits transacted without corresponding adjustments will lead to double claiming of emission reductions, both by the organizations buying and cancelling voluntary credits, and by the project host countries claiming progress toward emission reduction goals from the same sector.¹²⁰ Others question the validity of the double claiming argument in the context of corporate action, also pointing out that allowing the transfer of only correspondingly adjusted carbon credits will hinder the host countries’ ability to meet their NDCs and thereby jeopardize the global climate effort.¹²¹ In addition, securing government commitments to corresponding adjustments is expected to be cumbersome and costly, introducing uncertainties that could reduce the appeal of engaging in the VCM altogether.¹²² Market participants have furthermore highlighted the sovereign risk associated with host governments not honoring previously issued letters of authorization, not correctly applying corresponding

adjustments, or not issuing ITMOs for verified emission reductions from authorized projects.¹²³

Corresponding adjustments could also be an opportunity for some projects. But it is not all “doom and gloom” going forward from the perspective of developers of clean and improved cooking carbon projects. Market actors recognize that the willingness of governments to authorize clean and improved cooking activities in the context of Article 6.2 will open up doors to new sources of demand. With authorized carbon credits being available to international transfers and used toward NDCs or other international mitigation purposes (such as the CORSIA program for international aviation), developers of clean and improved cooking carbon projects traditionally selling in the VCM could use their credits to transact with buyers active in compliance markets. A similar opportunity could be availed through the Article 6.4 mechanism, to which a share of the clean and improved cooking activities registered under the CDM could potentially transition.

“More than two-thirds of countries are planning to use carbon markets to meet their NDCs, so the collective of Article 6 unit buyers is set to increase in the years to come. This offers opportunities for developers of clean and improved cooking carbon projects.”

– Development finance institution, sharing their views as part of the RCF4CCI

This convergence of voluntary and compliance demand offers opportunities on two levels. For individual project developers of clean and improved cooking projects, the prospect of new sources of demand could be met with premium pricing for clean and improved carbon credits that are authorized by host country governments. On a higher level, the confluence of voluntary and compliance buyers can contribute to more harmonized global action and less mistrust and confusion, and it can ultimately provide conditions for increased ambition.¹²⁴ Such an outlook is welcome at a time when the leading net zero guidance documents are favoring the use of carbon removal credits in the context of voluntary corporate net zero accounting, with emission avoidance credits being inadvertently devalued.

In light of these uncertainties in the market and the different ways in which national governments are introducing regulatory oversight over the carbon market, there is a need for host country governments to promote regulatory certainty for project developers and investors alike. This can be delivered through strengthened participatory processes that test fiscal

rules and incentives with market actors and socialize upcoming regulatory changes to reduce adverse market reactions when the changes are institutionalized.

ONGOING EFFORTS TO PROMOTE REGULATORY CLARITY

Several ongoing efforts are aiming to address host country capacities in transitioning to the new realities introduced under the Paris regime and de-risk the private sector investment case for engagement in Article 6. Existing initiatives can be broadly categorized as follows:

Best-practice guidance on transaction authorizations.

With the high-level guidance on cooperative approaches under the Article 6 mechanisms being delivered by the Conference of the Parties, international intergovernmental organizations and industry-led efforts are offering support and guidance on how project developers, investors, and policymakers can navigate through the new set of rules. Recent guidelines or initiatives include:

- The Global Green Growth Institute's Mobilizing Article 6 Trading Structures Program offers guidance to policymakers of host countries aiming to engage in international transfers of mitigation outcomes under Article 6 and builds capacity on institutional arrangements, including authorization, transfer, and tracking of ITMOs under Article 6. In doing so, the program aims to promote transactable project activities and de-risk the investment case for investors.¹²⁵
- The International Emissions Trading Association has issued guidance on how host countries can implement NDCs with an eye on attracting private sector investment. The association calls for governments to communicate a clear strategy for Article 6 implementation, establish which sectors and activities will qualify for authorization, and determine how the VCM will interact with compliance markets.¹²⁶

Article 6 transition support programs. A growing number of organizations and donor-backed initiatives are offering technical support to early movers who are looking to transition existing carbon market activities,

including VCM projects, to be eligible under Article 6 and promote innovative programs that allow policy instruments rather than projects to be certified and generate mitigation outcomes. While clean and improved cooking-specific support programs are not currently available, some relevant examples include:

- To support the transition to the Paris regime, the Gold Standard introduced an Article 6 Early Mover Programme that acts as a help desk to offer guidance to project developers, government officials, and other stakeholders related to the implementation of the Article 6 authorization process. The primary aim of this program is to move forward with pilot Article 6 transactions and generate opportunities for peer-to-peer exchange and knowledge-sharing to learn from successful experiences.¹²⁷
- The Gold Standard has partnered with GGGI to launch the *Innovative Policy Certification Programme*, which aims to pioneer scaled-up approaches under Article 6 by promoting a framework for certifying and issuing carbon credits for national or subnational policy changes. This marks a shift from the traditional project, or program-level interventions, certified under the Gold Standard.¹²⁸

Political risk insurance products. With government intervention becoming an increasingly relevant and likely risk factor in the carbon market, market actors face a growing sovereign risk that comes on top of quality and delivery concerns. In this context, international institutions and multilateral development banks are looking for ways to de-risk the investment environment for investors. While clean and improved-specific products are currently not available in the market, one example of a relevant sovereign risk insurance program is the Multilateral Investment Guarantee Agency of the World Bank's insurance arm. The agency protects carbon credit projects against political risks in high-risk host countries in a bid to facilitate large-scale investment in the carbon market. It does this by providing insurance support that shields investors from the risk of local governments blocking pre-agreed sales agreements. In doing so, the agency aims to bridge a gap in a market in which private insurance products are not yet readily available.

A woman prepares food on an LPG stove.

© Evans Ahorsu / Clean Cooking Alliance



PART FOUR

Looking ahead

The Principles introduced in this report aim to address real risks that stand to limit the growth and impact of carbon finance in the clean and improved cooking sector. Concerns over the climate integrity of carbon credits generated by clean and improved cooking carbon projects are in the spotlight, reducing buyer confidence in the ability of these credits to deliver the claimed climate mitigation impacts and benefits to households. At the same time, increasing market domination by a small number of established actors is making it difficult for new players to enter the market, restricting competition and hampering innovation.

The Principles are a starting point for launching better clean cooking carbon markets. They provide a first step toward the development of a voluntary Code of Conduct that will outline best-practice examples for their implementation, with a focus on project developers as key decision-makers in project design and implementation. The Code of Conduct will need to

be voluntary, at least certainly to begin with, as there are no obvious existing enforcement structures that could regulate adherence to the Code of Conduct. Until then, the Principles may be voluntarily endorsed by any type of market actor to guide its internal procedures and external market engagement.

Importantly, the Principles are intended to evolve and to encourage the generation of ever-higher-quality credits from clean and improved cooking. Annual consultations will provide a platform for signatories to report back on progress and help to keep commitments aligned with stakeholder progress and broader sectoral developments. Ultimately, the Principles will facilitate the integration of clean and improved-specific issues into wider carbon market initiatives such as the ICVCM, the International Carbon Reduction and Offset Alliance, the Science-Based Targets initiative, and the Voluntary Carbon Markets Integrity Initiative.



Food preparation on a LPG stove.

© Evans Ahorsu / Clean Cooking Alliance

A woman prepares food using a biogas cooker.
© KM Asad / Clean Cooking Alliance

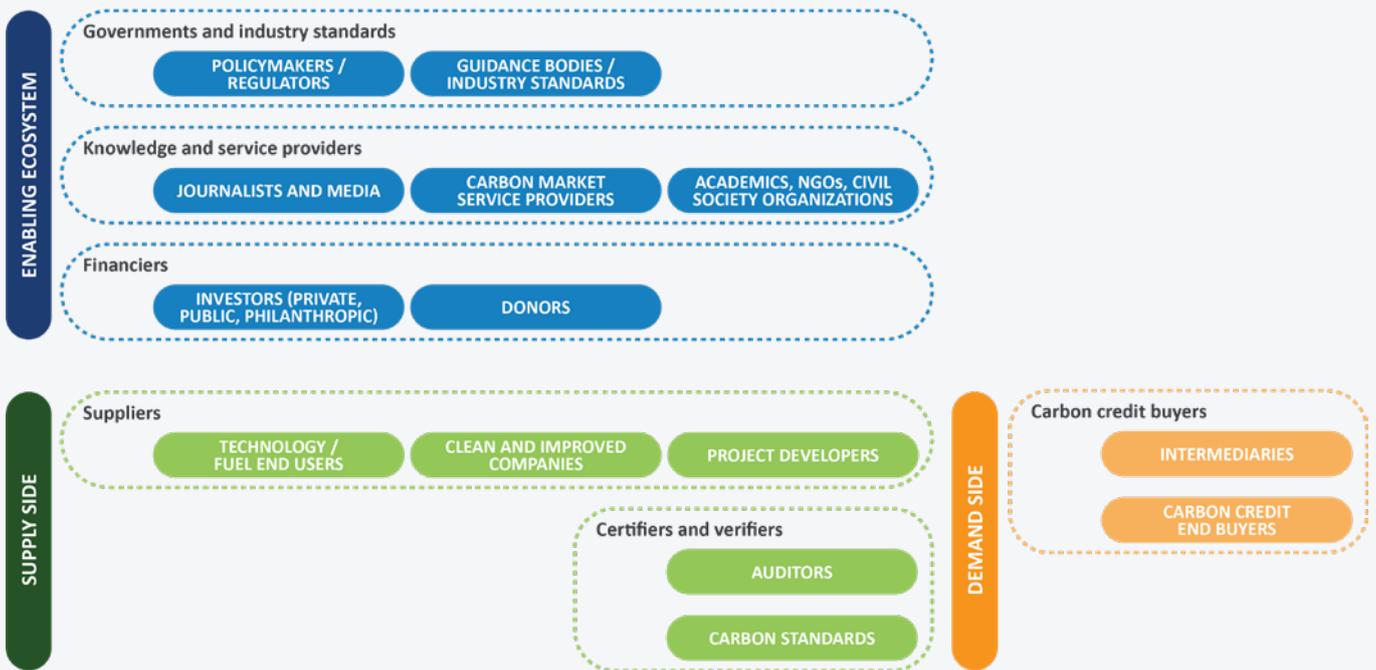


ANNEX 1

Definition of market actors

Figure 7 offers a visual overview of the ecosystem of market actors in addition to a description of each category of actor and their role in the carbon market ecosystem as a framework for our analysis. The figure covers both voluntary and compliance markets.

FIGURE 7
Overview of the ecosystem of market actors involved in carbon markets.



Note: These actors are not mutually exclusive and may overlap or have multiple roles in the carbon market. For example, a carbon market service provider may have a role as a consultant to project developers but may also own its own project and may buy and trade credits.

TABLE 4

Explanation of actor categories summarized in Figure 7.

	ACTOR	DEFINITION AND EXAMPLES
Governments and industry standards	Policymakers/regulators	Government and nongovernment agencies that may regulate carbon markets within their jurisdictions, or actors engaging in carbon markets within their jurisdictions. They may set rules and guidelines for market engagement and provide oversight. These include: <ul style="list-style-type: none"> • <i>National and local government</i>: May regulate how carbon markets operate in their jurisdiction. • <i>Compliance regulators</i>: Set boundaries for the types of carbon credits that are permissible under a certain compliance scheme • <i>Emission trading scheme regulators</i>: E.g., EU ETS • <i>Industry regulators</i>: E.g., ICAO's CORSIA
	Guidance bodies/industry standards	These are organizations that aim to provide guidance or direction to the carbon market but do not have any regulatory powers. E.g., Integrity Council for the Voluntary Carbon Market (ICVCM), Voluntary Carbon Markets Integrity Initiative (VCMI) providing guidance to carbon credit buyers on claims.
Knowledge and service providers	Academics, NGOs, civil society organizations	Groups that provide knowledge products, research, capacity building and awareness about the carbon market. They provide the market with guidance, analysis, and advocacy. This includes watchdog organizations that investigate carbon markets to identify malpractice and hold the market accountable.
	Carbon market service providers	Organizations offering support in the carbon certification process, market analysis, due diligence services for carbon credit buyers, and advisory services. They provide the market with guidance, analysis, and knowledge. Includes carbon credit rating agencies and consultancies.
	Journalists and media	Organizations that disseminate information on carbon market activities to the public, thereby influencing public opinion and perceptions regarding carbon markets.
Financiers	Investors (private, public, philanthropic)	Organizations that provide funding for clean and improved cooking carbon projects that in part depend on carbon finance for business model viability. These project initiators include: <ul style="list-style-type: none"> • <i>Private sector investors</i>: Besides financial returns, some investors (impact investors) may operate more patient business models and compensate financial returns for climate or broader sustainable development returns or impacts. • <i>Public sector investors</i>: Public financiers providing national or international/development finance that are primarily driven by de-risking the investment case for clean and improved cooking initiatives and creating an enabling environment. • <i>Philanthropic investors</i>: Funders that can deploy grants or patient capital with the view to de-risk investments and drive impact.
	Donors	Organizations that donate funding for clean and improved cooking carbon projects that in part depend on carbon finance for business model viability but do not do so as a business investment seeking to regain finance.

Suppliers	Technology/ fuel end users	<p>These are the actors whose use of cookstoves/fuels generate the emission reductions pursuant to which carbon credits can be issued. Technology end users may include:</p> <ul style="list-style-type: none"> • <i>Households/communities</i>: Individual households or communities that are aggregated under one program and reside within a predefined national or regional boundary. • <i>Institutions</i>: Schools, hospitals, prisons, and other public institutions.
	Clean and improved cooking companies	<p>Companies that develop and manufacture clean or improved cooking solutions for use in carbon projects. They are often also responsible for the sale and distribution of these technologies on the ground. These may be small local manufacturers or large-scale international companies that actively invest in product development.</p>
	Project developers	<p>Organizations that set up clean and improved cooking carbon projects. They are responsible for ensuring that their program meets the certifying standard's requirements. These include:</p> <ul style="list-style-type: none"> • <i>Private sector developers</i>: Commercial ventures with a primary motivation to operate financially sustainable business models. • <i>Development agencies, NGOs, and philanthropies</i>: Typically noncommercial ventures initiated by public sector funders or funders prioritizing climate and development impacts over or alongside financial returns.
Carbon credit buyers	Intermediaries	<p>Entities that connect buyers and sellers of carbon credits. They either directly purchase carbon credits from project developers and resell them in the market or support back-to-back transactions acting as a middleman. Intermediaries in the carbon market include:</p> <ul style="list-style-type: none"> • <i>Aggregators</i>: Carbon market players that oversee a portfolio of carbon projects and specialize in marketing carbon credits to corporate clients or investors. These entities can also act as project developers, investing capital in their bespoke projects while also managing the carbon project development and monetization process on behalf of other organizations. They may also offer upfront financing in return for future offtake agreements. • <i>Brokers and traders</i>: Liquidity providers that match suppliers of carbon credits with buyers. Typically, these intermediaries engage in back-to-back transactions and support simpler sales transactions. • <i>Exchanges</i>: Platforms that offer standardized offering of carbon credits to buyers, charging a transaction fee per carbon credit transacted. Exchanges generally support many sales to various buyers. • <i>Investment funds</i>: Dedicated investment vehicles that enter into long-term offtake agreements of carbon credits in exchange for price security to project developers. Investment funds may also offer upfront financing to cover project development costs. They generally on-sell carbon credits to a small group of end buyers. <p>The role of intermediaries in the carbon market is optional and depends on whether the project developer is able to transact directly with carbon credit end buyers or requests the support from an intermediary.</p>
	Carbon credit end buyers	<p>The ultimate driver of demand in the carbon market, generated by the following end user types:</p> <ul style="list-style-type: none"> • <i>Individuals</i>: Individuals that purchase (typically) small volumes of carbon credits to compensate voluntarily for their carbon footprint. • <i>Corporations</i>: Companies that purchase carbon credits to meet voluntary commitments (net zero, carbon or climate neutrality, broader sustainable development) or use carbon credits to in part meet compliance obligations (domestic carbon tax, emissions trading scheme, sectoral compliance). • <i>Public agencies</i>: Government agencies that source carbon credits to compensate for institutional or national emissions.
Certifiers and verifiers	Auditors	<p>Independent third-party organizations that validate and verify the credibility of carbon credits generated by project developers through third-party audits. These organizations ensure that the carbon credits meet the requirements of the carbon standard under which it is certified.</p>
	Carbon standards	<p>Organizations that provide a common framework for measuring and verifying carbon credits and develop and establish the criteria and methodologies for certifying the emission reductions generated. They also often manage the registries in which carbon credits are issued, transferred, and retired.</p>

ANNEX 2

Principles' Key Actions

Integrity

Project claims should be evidence-based, case specific, and substantiated.

I1: Baselines are realistic, up-to-date, and geography-specific. Any assumptions made are transparent and substantiated

KEY ACTIONS

Examples of key actions that market actors can take to fulfill this principle:

- *National government.* Commission research to determine the value of critical parameters (e.g., baseline fuel use, wood-to-charcoal conversion factor) as a means of attracting carbon finance.
- *Academia/research institutions.* Conduct research to determine the value of critical parameters (e.g., wood-to-charcoal conversion factor) for different geographies.
- *Ratings agencies.*
 - Award positive ratings to projects that use parameters that are realistic, grounded on scientific evidence and/or apply conservative assumptions. Projects that do so can attract higher carbon prices.
 - Collaborate with carbon standards and cookstove project developers in developing harmonized carbon methodologies that reflect real-life project factors and represent high-integrity standards.
 - Incentivize robust baseline measurement methods such as kitchen performance tests (KPTs) and digital monitoring devices by awarding higher ratings to projects implementing robust and reliable baseline measurement methods.
- *Journalists/media.* Award media coverage to projects that quantify baselines in line with the principle, allowing projects to receive recognition for doing so.
- *Donors.* Finance projects to update their baselines and finance development of realistic and geography-specific baseline data.
- *Project developers.*
 - Voluntarily update baselines in certified projects to bring them in line with the latest methodologies and tools. This is especially critical for older projects. Develop baselines in line with this principle for any new projects seeking certification.
 - Develop baselines from in-field measurements of baseline fuel consumption using Kitchen Performance Tests.
 - Have Water Boiling Tests, Controlled Cooking Tests or Kitchen Performance tests carried out by qualified independent organizations.
- *Aggregators.* Develop clean and improved portfolios meeting this principle to offer to clients seeking high-integrity projects. Make the value of these credits clear to clients to justify price premiums.
- *Carbon credit end buyers.* Pay price premiums for carbon credits that meet this principle.
- *Carbon standards.*
 - Update methodologies to more systematically ensure that scientific research or conservative assumptions are used in the quantification of baseline emissions.
 - Level the playing field by requiring already certified projects (not only newly registered projects) to update the methodologies used to

ensure that baselines are realistic, geography-specific, and conservative wherever assumptions are applied. This could include providing simplified or lower-cost procedures for doing so to incentivize updates.

- Collaborate with project developers and thought leadership initiatives to develop methodologies that encourage high-integrity baseline and project measurement methods.

I2: Fuel consumption or stove usage are accurately monitored. Any assumptions made are transparent and substantiated

KEY ACTIONS

Examples of key actions that market actors can take to fulfil this principle:

- *Guidance bodies.* Develop guidance on monitoring techniques and/or develop a catalog of monitoring devices available in specific geographies to ease access to them.
- *Ratings agencies.* Award positive ratings to projects that employ accurate monitoring and/or apply conservative assumptions, allowing these projects to attract higher carbon prices.
- *Journalists/media.* Award media coverage to projects that accurately monitor stove usage/fuel consumption, allowing projects to receive recognition for doing so.
- *Investors.* Actively seek out and invest in projects that employ accurate monitoring of stove usage and fuel consumption.
- *Donors.*
 - Provide finance to projects to implement accurate monitoring, including training on how to use monitoring devices and analyze data correctly.
 - Invest in research and development/upscaling of advanced monitoring techniques.
 - Provide finance to allow registered projects to update their project design documents to allow for monitoring approaches using data loggers/metering.
- *Technology providers.* Establish relationships with companies providing data loggers/metering devices

and market these alongside the clean and improved cooking devices offered.

■ *Project developers.*

- Implement accurate monitoring techniques to track stove usage and fuel consumption (e.g., leverage digital technologies to improve the efficiency, transparency, and quality of project monitoring results); and/or ensure that any assumptions made in monitoring performance are conservative (including demonstrating this in project documentation).
- Have Kitchen Performance Tests, where used, carried out by qualified independent organizations.
- Ensure that any data collected is provided with informed consent and gathered within the regulations of the given jurisdiction. Secure data protection is employed for any data that is collected.

■ *Aggregators.* Develop clean and improved portfolios meeting this principle to offer to clients seeking high-integrity projects. Make the value of these credits clear to clients to deserve price premiums.

■ *Carbon credit end buyers.* Pay price premiums for carbon credits that use accurate monitoring or apply conservative assumptions to quantify project emissions.

■ *Carbon standards.*

- Incentivize project developers to update the approaches applied in their project(s) by providing simplified or lower-cost procedures for making such updates where these improve environmental integrity.
- Develop clear and well-defined guidelines on acceptable method(s) to determine the adoption rate, the drop-out rate, and the portion of time the project stove is used.

I3: Only sustainable development benefits that are substantiated and can be evidenced are claimed

KEY ACTIONS

Examples of key actions that market actors can take to fulfill this principle:

■ *Guidance bodies/industry standards.*

- Develop sustainable development claims guidance. This guidance should outline the evidence needed to support each sustainable development claim and help homogenise how the impact of these sustainable development benefits are measured across the clean cooking sector. Guidance could include specifying the level in the causal chain of effects at which the sustainable development -benefits are claimed. For instance, claiming health benefits based on the number of households receiving a clean cookstove might not be appropriate, as these benefits may be counteracted if the household keeps using the baseline stove. It could also specify how to determine specific sustainable development benefits, such as suggesting survey questions and design approaches to credibly claim sustainable development benefits.
- Develop valuation approaches that can guide buyers and results-based financiers.

■ *Academics, NGOs, and civil society organizations.*

Conduct research on survey design that better captures whether sustainable development benefits claimed are materializing.

■ *Rating agencies.* Further develop ratings for sustainable development benefit claims to enhance market transparency on positive contributions to SDGs.

■ *Journalists/media.* Award media coverage to projects that meet this principle.

■ *Investors.*

- Actively seek out and invest in projects that yield substantiated sustainable development benefits.
- Incorporate impact metrics into investment valuation approaches to account for financed positive externalities.

■ *Donors.*

- Provide funding to projects to implement substantiated monitoring of sustainable development benefits.
- Provide funding for the development of sustainable development benefits claims guidance.

■ *Project developers.*

- Claim only those sustainable development benefits that can be substantiated and ensure sound recordkeeping and evidence of any claimed benefits. This can include evidencing sustainable development benefits using digital data methods for direct monitoring.
- Disclose any negative externalities, and put mitigation measures in place where possible.

■ *Carbon credit end buyers.* Pay price premiums for carbon credits from projects with substantiated sustainable development benefit claims.

■ *Carbon standards.*

- Develop guidance that clearly defines how to monitor sustainable development benefits and the type of claims that can be made depending on the monitoring approach employed (e.g. social surveys or digital sensors).
- Provide guidance for using digital methods for direct monitoring of sustainable development benefits.
- Provide guidance for third-party verifiers to be able to verify whether the sustainable development benefits claimed by projects are adequately substantiated.

Transparency

Non-commercially sensitive information on clean and improved cooking carbon markets should be accessible.

T1: The monetary and/or non-monetary benefits reaching the project and technology/fuel users are transparent within a given transaction

KEY ACTIONS

Examples of key actions that market actors can take to fulfill this principle:

■ *Guidance bodies/industry standards.*

- Require disclosure of benefit sharing with cookstove/fuel users.
- Facilitate creation of consensus as to what level of transparency is reasonable, and create templates for information sharing for the sector.

- *Academics, NGOs, and civil society organizations.*
 - Develop best-practice guidelines on benefit sharing with market actors across the value chain of a given transaction.
 - Investors, donors, and investment funds. Provide information on prices paid to projects and on prices the credits are sold for.
- *Project developers.* Share information on revenue use with carbon credit buyers and cookstove/fuel users.
- *Intermediaries.* Provide information on the monetary and/or non-monetary benefits reaching the project within a given transaction.
- *Carbon credit end buyers.*
 - Ask sellers for information on the monetary and/or non-monetary benefits reaching the project and technology/fuel users within a given transaction reaches actors across the value chain.
 - Establish a Non-Disclosure Agreement with project developers to gain visibility of the proposed use of carbon finance.
- *Carbon standards.*
 - Require disclosure on monetary and non-monetary benefit sharing with technology users in project documents.
 - Create templates for revenue sharing information for the sector.

Fairness

Carbon projects solicit informed consent from users and share revenue fairly along clean and improved cooking value chains.

F1: Informed consent precedes each user's participation in a carbon project

KEY ACTIONS

Examples of key actions that market actors can take to fulfill this principle:

- *Guidance bodies/industry standards.* Develop easy-to-understand standardized contracts and accompanying visual aids for use in different geographies.

- *Academics, NGOs, and civil society organizations.* Inform cookstove/fuel users of their rights. Journalists and media. Hold project developers accountable to the principle.
- *Technology/fuel users.* Ensure full understanding of any contract prior to signing it; ask questions where needed.
- *Project developers.*
 - Ensure that technology users are fully informed prior to signing any agreement.
 - Adopt simple contracts and train field staff in how to explain these to signatories.
- *Buyers.* Ensure due diligence processes require project developers to secure informed consent from households.

F2: Carbon revenues are shared by all stakeholders in a way that is proportionate to the risk they assume and the value they create

KEY ACTIONS

Examples of key actions that market actors can take to fulfill this principle:

- *Guidance bodies/industry standards.*
 - Develop guidance for determining best-practice carbon revenue sharing under different business models and pricing scenarios. The guidance may wish to distinguish fixed amounts, for instance cookstove subsidies, from variable amounts that may depend on remaining revenue after costs have been covered.
 - Develop guidance for investors and intermediaries on determining proportionate shares of carbon revenue.
- *Academics, NGOs, and civil society organizations.* Support project developers to develop and implement business models that benefit cookstove/fuel users.
- *Journalists and media.* Report on whether cookstove/fuel users are receiving a share of carbon revenue, including showcasing projects that do this well.

- *Technology/fuel users.* Ask project developers to provide information on how revenue will be shared.
- *Project developers.*
 - Commit to providing a share of revenue and/or profits to cookstove/fuel users (e.g. through providing subsidized access to technologies or free maintenance/warranties on technologies).
 - Ask intermediaries to provide information on fees and ultimate sale prices.
- *Intermediaries.*
 - Aggregators: Commit to providing a given share of revenue to projects or awarding a bonus where higher sale prices are achieved.
 - Investment funds: Commit to providing a given share of revenue to projects or awarding a bonus where higher sale prices are achieved.
- *Carbon credit end buyers.* Ask sellers about revenue sharing.

Sustainability

Carbon markets complement other forms of funding and do no long-term harm to local clean and improved cooking markets.

S1: Carbon finance, official development assistance and philanthropic capital are complementary

KEY ACTIONS

Examples of key actions that market actors can take to fulfill this principle:

- *Investors and donors.*
 - Facilitate the entry of new clean and improved companies to access carbon markets.
 - Invest in activities and institutions that directly complement carbon project development and support the establishment of a broader enabling environment for clean cooking. This includes technical assistance to host countries to design stove standards and other regulatory mechanisms, and building capacity for countries to establish robust monitoring, reporting, and verification mechanisms.

- *Project developers.* Offer full transparency to all funders on the amounts of finance received, how these funds will be used, and any terms linked to the delivery of the finance.

S2: The positive effects of carbon finance on clean and improved cooking markets are promoted, while excessive market distortions are avoided

KEY ACTIONS

Examples of key actions that market actors can take to fulfill this principle:

- *Academics, NGOs, and civil society organizations.*
 - Develop guidance for evaluating what would constitute an excessive market distortion and how to avoid it. This would include making clear that in some specific cases (e.g., in extreme poverty), full subsidization of a clean and improved solution is justified.
 - Develop best-practice case study examples of programs designed specifically to avoid excessive market distortions.
- *Journalists and media.* Hold actors accountable to the principle.
- *Investors and donors.* Evaluate potential investments/funding opportunities with a view specifically to consider whether there is a risk of excessive market distortions that are unjustified.
- *Project developers.*
 - When designing business models, consider whether there is a risk of the project causing excessive market distortions, and how to avoid this (e.g. defining eligibility criteria for subsidization).
 - Make any subsidies provided fully transparent in publicly available project documentation.
- *Intermediaries.* Avoid transacting carbon credits from projects with business models that cause excessive market distortions.
- *Carbon credit end buyers.* Avoid purchasing/using credits from projects that create excessive market distortions or where pricing is not transparent.

S3: National policies facilitate the development of clean and improved cooking carbon markets.

KEY ACTIONS

Examples of key actions that market actors can take to fulfill this principle:

- *Governments.*
 - Welcome discussion with, and exchange of experiences with, carbon market actors to understand leading concerns that hinder fostering an enabling environment.
 - Evaluate the impact of any regulatory changes on national carbon markets in the near and long term.
 - Ensure that advanced regulatory notice is provided to all actors long before a given regulation comes into effect that would affect the clean or improved cooking sector.
 - Be transparent about the use of any income used from the charging of taxes or fees on carbon revenue.
 - Leverage carbon markets to scale up public investments in clean and improved cooking markets, e.g., by establishing a national
- programmatic approach that allows “nesting” of subnational programs.
- *Investors.* Voice the need for regulatory clarity and engage in discussion with policymakers to make clear what constitutes an enabling environment for foreign and domestic investment into clean and improved cooking carbon projects.
- *Donors.* Engage with policymakers to identify how to address any capacity gaps inhibiting the ability of policymakers to make informed decisions regarding carbon market regulations. Develop targeted technical assistance programs to address these.
- *Insurance companies and development finance institutions (DFIs):* Develop insurance/ guarantee solutions that cover political and regulatory risk to de-risk and therefore encourage investment in the carbon industry despite changing regulations.
- *Project developers.* Enter into dialogue with local and national authorities to clarify minimum conditions that are required to ensure business model viability of clean and improved cooking carbon projects in the carbon market.
- *Guidance bodies.* Promote responsible government policy action by presenting best practices.

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- b These carbon finance volumes represent indicative figures only, estimated based on retirement and issuance activity. The lower bound price estimate is based on retirements multiplied by historical carbon prices; the higher bound estimate is instead a function of issuances multiplied by historical carbon prices. Since transactions in the carbon market include both spot transactions (of issued carbon credits) and forward transactions with partial prepayments, the exact timing of actual revenue to project developers will differ. These calculations assume that intermediaries withhold 30% of the total transaction value.
- c The retirements track what is taken off the market, but is not an indication of transactions in the market. Buyers often source issued credits for future use, and retire credits only when needed. This means that a share of issued volumes has already been contracted.
- d Each bar in the graphic represents issuance from a different methodology. From top to bottom these methodologies include: VMR0006 (12.6 MtCO_{2e}), Methodology for Improved Cookstoves and Kitchen Regimes (8.1 MtCO_{2e}), Simplified Methodology for Efficient Cookstoves (2 MtCO_{2e}), AMS-II.G Energy efficiency measures in thermal applications of non-renewable biomass (39.7 MtCO_{2e}), AMS-I.C (16.1 MtCO_{2e}), AMS-I.E Switch from non-renewable biomass for thermal applications by the user (14 MtCO_{2e}), Combined CDM methodologies (8.1 MtCO_{2e}), and AMS-I.I (2.8 MtCO_{2e}). Cumulative issuance data from 2008 to 2023.
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A woman prepares food
using a gas cooker.
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