CLEAN COOKING CARBON MARKETS

Overview of the Project Development Process

KEY MESSAGES

This briefing note provides a high-level overview of the carbon certification process for clean cooking projects.

It is intended for clean cooking enterprises that are exploring carbon financing possibilities.

Each step in the certification process is summarised alongside the estimated cost, duration, and entities typically involved.

The key procedural differences between the two most applied voluntary carbon standards – the Gold Standard and Verra – in each step are highlighted.

A cost-benefit tool is available for download here. It allows clean cooking enterprises to model estimated carbon revenue income under different pricing and issuance volume scenarios

INTRODUCTION

Carbon markets can offer an important source of revenue for clean cooking projects. These results-based revenues are pivotal to enabling clean cooking programs to operate at scale, and can be significant (Box 3). Carbon markets have facilitated considerable investments in the clean cooking sector, especially over the last three years. The year 2023 saw record carbon credit issuances from clean cooking activities, despite rocky market conditions.[1]

But the journey towards successful carbon certification is complex. Projects must demonstrate that they meet the certification requirements set out by carbon standards and hire independent third parties to validate/verify the performance of the project. Carbon finance is therefore only attractive to projects that can deliver a scale large enough to overcome these costs and meet the requirements of carbon standards for certification.

This note[2] seeks to inform clean cooking ventures on the steps associated with bringing a clean cooking initiative to the carbon market. It offers insight into key considerations that prospective project developers need to be aware off when considering carbon financing for their programmes, including the steps associated with the carbon asset development cycle, key eligibility criteria, and associated costs and timelines.

THE CARBON PROJECT CYCLE

BOX 1: STRATEGIES FOR FINANCING THE CARBON PROJECT CERTIFICATION

Carbon project development can be a costly undertaking, requiring upfront financing that only well-capitalised clean cooking ventures can shoulder. There are several strategies for lowering the barrier to entry to the carbon market by considering partnerships with established intermediaries, raising upfront finance through forward sales, or joining an existing carbon programme.

1. **Partnering with an intermediary:** Experienced carbon market service providers that have a track-record with carbon project development and carbon credit sales can reduce or eliminate the upfront financing barrier faced by new market entrants. Typically, these service providers take over the full responsibility over the carbon project development process in return for a share of future carbon credits or carbon revenues generated.
2. **Raising upfront finance through forward sales:** Some buyers can provide upfront finance in return for a favourable forward price at which the project developer commits to sell future carbon credits. This upfront finance is specifically intended to cover the carbon project certification costs. It may also extend to fund operational activities such as cookstove production and distribution. Generally, the more funding is made available upfront, the higher the expected discount will be on the forward price per credit.
3. **Joining an existing carbon programme:** A third route to market is to join an existing carbon programme that is open to involving other clean cooking distributors. Under such an arrangement, the clean cooking venture needs to ensure that it meets the eligibility criteria for inclusion into the existing programme; as listed in the Project's Design Document. The inclusion process itself involves a simplified validation step, lowering the costs relative to registering a new project. In return for joining, the owner of the existing programme will typically request a share of future carbon credits or carbon revenues, sometimes alongside a joining fee to cover their administrative costs.

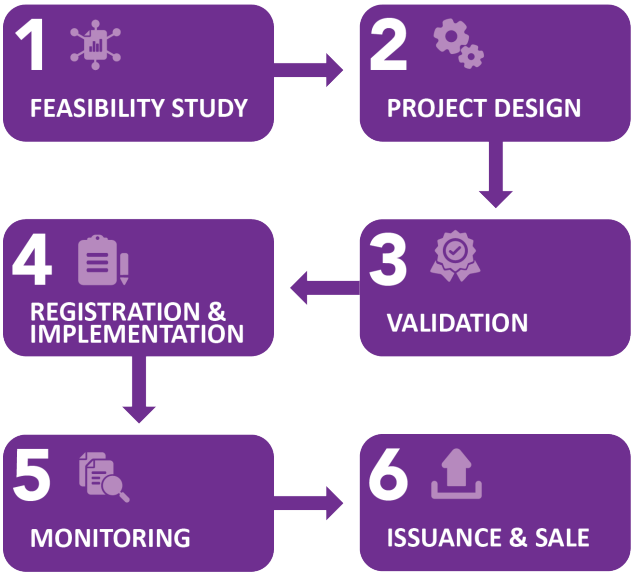
For more information about how different carbon credit transaction structures influence access to carbon finance, please refer to the briefing note in this series entitled 'Making Carbon Finance Work for Clean Cooking: How different carbon credit transaction structures influence access to carbon finance'.

The carbon project cycle consists of several distinct phases (Figure 1) that clean cooking project developers need to navigate through before being able to claim certified emission reductions in the form of carbon credits that can be traded in the voluntary carbon market.

A clean cooking venture can consider two strategies to implement the carbon project development process. Under the first strategy, the venture takes on all carbon project development expenses, which are typically overseen by a specialised consultant that is contracted to offer the support. Under the second strategy, the venture requests support from a specialised intermediary that upfronts all associated costs and manages the carbon asset development process on behalf of the venture. In return for taking on this service, the intermediary will receive a share of future carbon credits generated by the carbon project. The pursued strategy has implications on the upfront investment needs, as well as future carbon revenues derived from the carbon project. There are also several options for reducing the upfront certification costs, as outlined in Box 1.

Two carbon standards dominate certification of clean cooking activities in the market today: the Gold Standard, and Verra (Figure 2). While development of carbon projects follows a similar path under both standards, there are important distinctions between the two routes which can impact a project developer's choice of certification standard. For this reason, noteworthy differences between these two standards are indicated in the project cycle overview below.

Figure 1. Summarised carbon project development cycle



BOX 2: EXPLANATION NOTE

Responsibility: Project developer; Auditor; Carbon standard

Cost: All costs provided are indicative only. Actual costs will depend on the scale of the project, its location, and the applied methodology.

Time: The time needed for each step is indicative only. Actual time will depend on the complexity of the project.

STEP 1: FEASIBILITY STUDY

Responsibility:

Cost: US$ 5,000 – 10,000

Time: ~3 months

Carbon standards do not have requirements covering feasibility studies. However, a feasibility study is generally the first step prospective project developers take to decide whether certification under an existing carbon standard is possible and financially viable.

A feasibility study evaluates the following elements:

- Availability of a suitable greenhouse gas accounting methodology.
- Eligibility of a project against one or several carbon standards' rules.
- Baseline fuel consumption data to inform an initial estimate of the greenhouse gas emission reduction potential per clean cooking technology.
- Baseline survey needs, which will depend on baseline data availability and/or the greenhouse gas accounting methodology chosen.
- A cost-benefit analysis of carbon financing, weighting expected costs (fixed as well as variable related to project size) versus revenues and offering insight into minimum project size requirements (Box 3).[3]

A feasibility study is typically prepared by an external consultant and presented in the form of a technical report backed by a financial model.

BOX 3: CASE STUDY: COST-BENEFIT ANALYSIS OF A CLEAN COOKING CARBON PROJECT

The economic viability of carbon project development should be confirmed by a prospective project developer through a feasibility study. Several critical assumptions determine the outcome of this assessment:

- **Number of clean cooking technologies distributed and in use.** The speed at which a project can distribute technologies to end-users and the degree to which they are used have a leading impact on the carbon revenue generation potential of a project. Micro-scale activities distributing only several thousand units may therefore struggle to recoup the upfront fixed costs associated with carbon project development unless they join an existing programme or can attract premium pricing.

- **Emission reduction potential per technology.** Based primarily on the portion of time a project stove is used relative to the baseline, that amount(s) of fuel(s) used before and during the project and the portion of fuel that can be considered non-renewable.

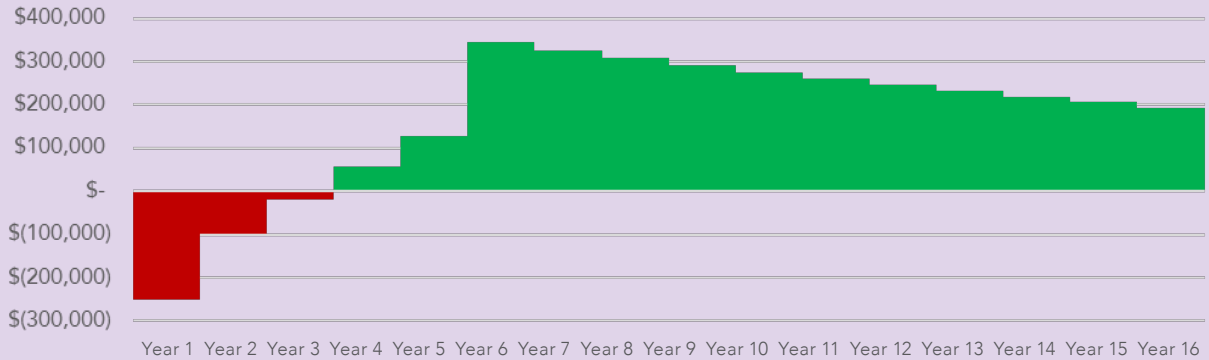
- **Carbon credit price.** Positive returns for carbon project developers can only be achieved if the sales price of carbon credits generated is sufficiently high to recover the project development costs and capital expenditures associated with the production, marketing, distribution, and maintenance of the clean cooking technologies distributed. Even relatively small projects may thrive if high carbon prices are offered by buyers.

A cost-benefit tool developed as part of this briefing note (accessible here) can offer a first step for clean cooking entrepreneurs to evaluate whether the voluntary carbon market offers an attractive financial strategy to fund business operations. The tool allows the user to simulate the impact of carbon project development on net cash flows and internal returns of investment (IRR) under various implementation, emission reduction potential, and carbon pricing scenarios. The tool also offers users the option to evaluate overall business profitability by including non-carbon related business development costs.

Figure 3 visualises the net cash flow projection of a clean cooking carbon project that targets the distribution of 15,000 clean cookstoves over a period of 5 years. Accounting for an annual 5 percent drop-off rate of the technology and assuming monetization of the first carbon credits in year 2 (2025), the project is expected to reach break-even point by year 3 at an average price per carbon credit of US$ 10 per tonne. The investment in carbon project development, adjusted for a net cost[4] of the clean cooking technology of US$ 50 per stove, offers an IRR of 35%.

It should be noted that the above simulations serve illustrative purposes only. The reader is encouraged to consult the cost-benefits Tool on MECS website to generate an initial insight into the economic viability of carbon project development. As the Tool represents a simplified approach to determine the cost-benefit of carbon project development for a clean cooking venture, its outputs are not meant to replace a detailed feasibility assessment

Figure 3. Net cash flows assuming a carbon price of US$ 10 per tonne over a 15-year period



STEP 2: PROJECT DESIGN

Responsibility: 

Cost: US$ 50,000 – 75,000 (upfront)

Time: ~6 months

At the heart of any project is the Project Design Document (PDD). Carbon standards provide fixed templates for PDDs, which include the following elements:

a) Eligibility criteria

Projects must evidence how the proposed clean cooking project meets the standard's and methodology's eligibility criteria. These relate to characteristics of the technology (e.g. size[5]), prevention of double counting[6], and ownership of carbon credits.[7] Projects submitted more than one year after their start date are not eligible for carbon financing. Another important eligibility criterion is a project's additionality, in which projects must demonstrate that it would not be financially viable in the absence of carbon finance.

b) Greenhouse gas emission reductions

A greenhouse gas accounting methodology approved for use by the selected standard defines how to calculate a project's emission reductions. It does so by defining how to calculate baseline, project and leakage emissions. It also lists the equations that the project developer must use to calculate the emission reductions. The emission reduction calculations must be prepared in a spreadsheet transparently showing all calculation steps, including an ex-ante estimate of future emission reductions. The calculation relies on data collected through a centralised project database[8], which transparently tracks and traces details of each individual technology implemented. Some carbon standards offer emission reduction calculation templates that can facilitate this step.[9]

c) Sustainable Development Goals

In addition to monitoring and reporting on greenhouse gas reductions, voluntary carbon projects also need to measure their contributions to Sustainable Development Goals (SDG) or co-benefits. Carbon standards provide additional guidelines on how this is to be conducted on project-level.[10] For more information on how clean cooking projects approach SDG reporting, please see the resources provided on MECS' website here.

d) Monitoring plan

The project must adopt a monitoring plan that stipulates how project performance will be captured. This includes specifying the parameters that will be monitored during the project, including their frequency and any quality control procedures that are in place to ensure results are reliably captured. The key roles and responsibilities of team members are also listed, alongside protocols relating to the collection of stove sales records, and management of a project database that records details of all the clean cooking solutions implemented. Finally, the project will need to specify the duration of the crediting period during which the monitoring plan will be valid. The crediting period represents the duration over which carbon credits can be generated. A project's baseline usually needs to be renewed at the end of crediting period (if its renewable); however different rules apply depending on the carbon standard and adopted methodology.[11]

e) Stakeholder consultation

The project must conduct a local stakeholder consultation prior to the start of implementation. This involves a (physical) stakeholder consultation meeting to allow affected individuals, communities, and/or organisations to share feedback about the project's impacts. Carbon standards have requirements for how these consultations must be carried out and documented. The outcomes of the stakeholder consultations must be documented in the PDD, or delivered as a separate document. At this stage, the project developer will need to open an account with the standard on its registry. All final documents prepared during the project design stage and future carbon certification steps will need to be publicised to this registry.

Table 1. Key differences in the project design phase between Gold Standard and the VCS

Gold Standard for the Global Goals	Verified Carbon Standard
• A crediting period is renewable every 5 years for a total of 15 years. • Projects must contribute to at least 3 SDGs, and use the SDG Impact Tool. • Extensive local stakeholder consultations requirements, which must consist of a minimum of two rounds, including one physical meeting and one stakeholder feedback round lasting for at least one month.	• A crediting period can be either fixed for 10 years, or renewable every 7 years for a total of 21 years. • Projects must contribute to at least 3 SDGs, and can also seek certification of these via SD VISta. • A local stakeholder consultation must be carried out before the start date of the project.

STEP 3: VALIDATION

Responsibility:

Cost: US$ 10,000 – 20,000 (upfront)

Time: 3-6 months

The completed PDD and accompanying documents (e.g. emission reduction calculation spreadsheet, stakeholder consultation report, baseline study) are audited by a certified independent third-party assessor known as a validation and verification body (VVB). This organisation conducts a thorough check of the project through a desk review and a field visit to confirm that the project is in line with the standard's rules and requirements.

The contracting of the VVB is the responsibility of the project developer. The project developer is required to accompany the auditor during a site visit, and facilitate access to key project personnel or other stakeholders. The project will need to adjust its procedures where any inconsistencies are found.

The VVB prepares a Validation Report which presents independent conclusions on the project's eligibility for certification under the selected standard. Several rounds of questions may be raised by the VVB to the project developer during this process to close any outstanding questions. A final validation opinion, alongside the updated PDD and accompanying documents, are submitted to the standard through its registry system. The standard will review the submitted documents and specify any required revisions.

STEP 4: REGISTRATION

Responsibility: 

Cost: US$ 3,000 – 5,000 (upfront)

Time: ~2 months

The project's registration with a carbon standard is publicised on the standard's registry upon successful closure of any comments raised by the standard and payment of a registration fee. The registration date does not have to align with the start date of project implementation; different rules apply depending on the carbon standard with regards to the rules around the timing of activity implementation and the start date of the crediting period. Under certain circumstances, retroactive crediting may be applied to technologies that have been distributed prior to the registration date of the project.

Table 2. Key differences in the registration phase between Gold Standard and the VCS

Gold Standard for the Global Goals	Verified Carbon Standard
• Annual fee for registry account: $1,000. Fee for reactivating registry account: $2,500 • Fee of US$ 900 for preliminary review/listing of a project • No additional registration fee	• Fee to open registry account of US$ 500, plus US$ 500/year for account maintenance • Fee of US$ 1,000 to request listing of a project • Fee of US$ 2,500 to register a project

STEP 5: MONITORING AND VERIFICATION

Responsibility: 

Cost: US$ 30,000 – 50,000 (recurring)

Time: ~6 months

The project developer is responsible for monitoring the performance of the project as per the monitoring plan laid out in the PDD. For clean cooking projects this typically relates to the continuous updating of the database system throughout the duration of each monitoring period, as well as monitoring performance annually or biennially. The length of a monitoring period can be determined by the project developer and can range from several months to several years. Typically, project developers apply an annual monitoring period, triggered by the carbon credit delivery conditions agreed with buyers.

Conducting annual or biennial monitoring surveys involves confirming the project's performance

and baseline data. Monitoring surveys are usually carried out via questionnaires that evaluate fuel and cookstove usage patterns, as well as establish any sustainable development impacts that are claimed in the approved monitoring plan. Surveys are conducted on a representative sample of clean cooking users. Depending on the methodology applied, project performance can also be established through data loggers or metering of energy use.

The realised fuel savings measured through the monitoring activities are used in combination with other parameters to determine greenhouse gas emission reductions achieved. The results are presented in a detailed Monitoring Report, which reports both climate and other sustainable development benefits over the monitoring period.

The Monitoring Report is submitted for an audit by a VVB in a process that is procedurally similar to *Step 3: Validation* outlined above.

The VVB will typically require a physical site visit to audit the monitoring results presented in the Monitoring Report. The project developer is expected to accompany the VVB during such a visit, and clarify any questions that arise during the process. The VVB issues a Verification Report which evaluates if the monitoring activities have been conducted in accordance the rules of the standard and methodology applied. This verification opinion, alongside the final Monitoring Report and accompanying documents is submitted by the VVB to the standard through its registry system. The standard will review the submitted documents.

STEP 6: ISSUANCE AND SALE

Responsibility:

Cost: Varies depending on issuance volume

Time: ~1 month

Approval of the request for carbon credit issuance is publicised on the standard's registry upon successful closure of any comments raised by the standard during the verification phase. The actual issuance of carbon credits is only processed once the project developer settles the issuance fee charged by the carbon standard. Upon doing so, the verified volumes of carbon credits are transferred to the registry account of the project developer. Each carbon credit carries a unique serial number, ensuring its traceability and avoiding the risk that the same carbon credit can be retired twice.

Clean cooking projects that have completed the issuance step can offer buyers immediate delivery of issued carbon credits. Such sale is known as a 'spot' sale. Projects can also offer buyers future deliveries of carbon credits in exchange for (partial) pre-payment. This also helps to hedge future exposure to price uncertainty, by locking in the price for (a share) of future carbon credits.

Table 3. Key differences in the issuance phase between Gold Standard and the VCS

Gold Standard for the Global Goals	Verified Carbon Standard
• For first issuance a fee of US$ 0.15 per carbon credit, minus US$ 1,000 paid for performance review. • For subsequent issuances, US$ 0.30 or US$ 0.10 per credit + 2% of credits, minus US$ 1,000 paid for performance review.	• Issuance fees of US$ 0.20 per carbon credit

ENDNOTES

[1] Galt, H.; Mikolajczyk, S.; Long, I.; Della Maggiore, M.; Bravo, F. and Tierney, M. (2023) The Role of Voluntary Carbon Markets in Clean Cooking. Climate Focus and the Modern Energy Cooking Services programme.

[2] This Briefing Note is a publication in a series of carbon market briefings commissioned by the Modern Energy Cooking Services (MECS) programme. Previously published briefings in this series includes how carbon credit transaction structures influence access to carbon finance and the Sustainable Development Goal benefits associated with clean cooking carbon projects in today's carbon market.

[3] Carbon revenues are a function of i) a project's size; ii) foreseen implementation schedule; iii) type of deployed cookstove(s) technology/ies; iv) baseline fuel use condition(s); and (v) expected carbon price(s).

[4] The net cost refers to the subsidy amount offered by the clean cookstove business to its customers. This assumes the venture offers the clean cookstove at a reduced price to end-users in return for the rights to claim the emission reductions generated from the use of the clean cookstove. The subsidy amount will differ depending on the technology type, targeted customer group, and business model.

[5] For example, small-scale methodologies will cap the maximum scale of the project, thereby limiting the number of technologies that can be included in a project. Carbon standards award simplified procedures to small-scale projects; but they will not be financially viable unless high carbon prices are attainable.

[6] Project developers must ensure that project devices are not counted more than once and are not included in more than one project. Avoidance of double counting of emission reductions can be achieved by generating unique serial-number identifications for the devices and tracking end-user locations, for example.

[7] Project developers need to proactively inform end-users that they are participating in a carbon project and have end-users waive their rights to the emission reductions they generate. The project developer can use various methods to inform the end users. For example, leaflets can be distributed with the products alerting end-users to the waiving of their carbon rights in exchange for a discount on the cost of stove.

[8] One important element that needs to be in place when a carbon project starts is the operationalisation of a database system that records distributed clean cooking technologies. The database needs to keep track of unique serial numbers associated to each cookstove, the GPS coordinates of distributed stoves, and information about the customers. Tracking of implementation progress through the database forms the basis of the measuring of the greenhouse gas emission reductions generated under the carbon project.

[9] Emission reduction tools for estimating the issuance potential of carbon credits from cookstove projects developed under the Gold Standard for Global Goals can be found accessed here.

[10] The Gold Standard integrates Sustainable Development Goals reporting within its standard guidelines; Verra's Verified Carbon Standard offers additional co-benefits certification through SD VISta, a separate certification track.

[11] The project crediting period generally starts on the same day as the project start date. Depending on the methodology adopted, carbon standard applied and length of the crediting period, there may be need for the updating of some baseline parameters during the crediting period; while others are to be updated at renewal of the crediting period.

ACKNOWLEDGEMENTS

This work has been funded by Loughborough University and Modern Energy Cooking Services.

Modern Energy Cooking Services (MECS) is a seven-year programme funded by UK aid (FCDO) which aims to accelerate the transition in cooking away from biomass to modern energy. By integrating modern energy cooking services into energy planning, MECS hopes to leverage investment in clean electricity access, both grid and off-grid, to address the clean cooking challenge. Modern energy cooking is tier 5 clean cooking, and therefore MECS also supports new innovations in other relevant cooking fuels such as biogas, LPG (bio) and ethanol, though the evidence points to the viability, cost effectiveness, and user satisfaction that energy efficient electric cooking devices provide. The intended outcome is a market-ready range of innovations (technology and business models) which lead to improved choices of affordable, reliable and sustainable modern energy cooking services for consumers. We seek to have the MECS principles adopted in the SDG 7 global tracking framework, including integrating access (7.1), renewables (7.2) and energy efficiency (7.3) and promote an informed integrated approach.

For more information, visit www.mecs.org.uk

Authors
Szymon Mikolajczyk and Hilda Galt

Design
Elisa Perpignan

Citation
Citation: Mikolajczyk, S. and Galt, H. (2023). *Clean Cooking Carbon Markets: Overview of the Project Development Process. Climate Focus and the Modern Energy Cooking Services programme*

This material has been funded by UKAid from the UK government; however, the views expressed do not necessarily reflect the UK government's official policies.