CLIMATE FOCUS

MORE THAN JUST A CARBON PROJECT

How clean cooking projects certified under the Gold Standard approach SDG claims

KEY MESSAGES

An analysis of all clean cooking activities certified under the Gold Standard reveal that improved health (SDG3), affordable and clean energy (SDG 7), and responsible production and consumption (SDG 12) are the most claimed non-carbon benefits.

Most clean cooking activities measure their SDG contributions by monitoring activities and outputs directly in their control, rather than the broader impacts of clean cooking.

The publication of the Gold Standard's SDG Impact Tool will help to streamline SDG monitoring approaches across certified projects. Most of the projects already certified take divergent approaches to monitoring SDG impacts.

The averted disability adjusted life years (ADALYs) methodology relies on a slightly outdated tool to calculate ADALYs. Most of the uncertainty lies in how projects are allowed to measure inputs into the tool.

Carbon credit buyers are willing to pay more for credits that also yield SDG benefits but tend not to require rigorous monitoring to confirm benefits. Buyers instead often assume that by the very nature of clean cooking activities that these projects will yield SDG benefits.

The number of SDGs impacted is more important to carbon credit buyers than the scale or longevity of the project's sustainable development impacts.

INTRODUCTION

Globally, 2.4 billion people cook their food using open fires or inefficient stoves that harm their health, the climate, and the environment. This contributes to 3.2 million premature deaths annually, disproportionately affecting women and children, and costs USD 2.4 trillion in damage to the climate and local economies.[1,2,3] Reliance on firewood and charcoal for cooking has also led to forest degradation and deforestation, as forest resources are harvested to meet fuel demand. Women and children bear the brunt of these household chores and spend significant parts of their daily lives collecting fuel; time that could be used for other activities.

Diligent design and targeted implementation of clean cooking activities can directly deliver multiple benefits across several Sustainable Development Goals (SDGs) (Figure 1). They can help to improve household health and safety, reduce poverty, and ensure access to clean energy. Distribution of modern energy cooking services can also generate multiple economic and social benefits by developing local capacity and alternative jobs from the production and sale of stoves and renewable fuels in local markets.[4]

To certify their SDG benefits, many clean cooking projects are registered under Gold Standard for the Global Goals (hereafter referred to as the Gold Standard), a carbon standard. To date, the Gold Standard has certified 218 clean cooking projects, resulting in a total of 25 million tonnes in emission reductions as of January 2023. Only five countries are host to 95 percent of all global issuances of carbon credits from clean cooking activities: China hosts over half of all registered clean cooking activities, followed by Nepal, India, Viet Nam, and Cambodia.

Figure 1. SDG benefits of clean cooking projects.

Source: Clean Cooking Alliance (2022)

This briefing paper provides an overview of the SDG benefits claimed by clean cooking projects registered under the Gold Standard, and the approaches adopted to claiming these benefits.

Monitoring SDG claims under the Gold Standard

Since 2017, the Gold Standard has required carbon projects to report verified contributions to at least two SDGs in addition to SDG 13 (Climate Action), resulting in SDG labels or tags on carbon credits. Identifying and reporting specific SDG contributions allows carbon credit buyers and other results-based funders to better understand the impact of clean cooking activities on specific SDGs.

The Gold Standard requires project developers to assess a project's impact against baseline conditions (i.e., conditions that would have existed in the absence of the project activities) to determine if the SDG claims are additional to business as usual. Projects are required to use clear indicators to demonstrate impacts through measurements (e.g., number of jobs created, workshops conducted, reduction in emission of local air pollutants) or estimations (e.g., through a survey of affected stakeholders). These indicators are typically included in a monitoring plan and verified by a third-party verification body. While data availability and measurability of indicators will affect the process of monitoring and verifying impacts, the approach is flexible enough for project developers to identify suitable indicators and targets based on the costs and available resources.

To support projects in this process, the Gold Standard has developed an SDG Impact Tool for measuring and reporting SDG contributions and the Impact Quantification Methodology to Estimate and Verify Averted Disability Adjusted Life Years (ADALYs) for Cleaner Household Air aims to monitor change in personal exposure to harmful pollutants as a result of clean cooking (Box 1). The use of this methodology allows project developers to quantify and generate health impacts.

The SDG Impact Tool helps carbon projects to identify their SDG impacts and monitoring indicators based on the five principles of credibility, efficiency, comparability, flexibility, and compelling reporting. Importantly, the SDG Impact Tool facilitates the translation of SDGs – which are designed for national monitoring and progress reporting – to project-level indicators and outcomes. The Tool allows users to select relevant SDG impact indicators for their project and defines how assessment and monitoring shall be conducted for the selected indicator while setting minimum monitoring requirements, where applicable. The use of the tool is mandatory for all new projects submitted after March 14, 2022. Any projects certified before this date can use the SDG Impact Tool on a voluntary basis until the end of their ongoing crediting period after which application is mandatory.

Box 1. A critical analysis of the Methodology to Estimate and Verify ADALYS from Cleaner Household Air

Figure 2: Overview of inputs and outputs in the Household Air Pollution Intervention Tool (HAPIT).

PROJECT INPUTS

Project input	Source
Baseline and biennial personal exposure	Gravitational or optical personal exposure monitoring
Number of targeted households	Project scope/database
Number of people and children under 5 years	Survey or Clean Cooking Alliance default
% of population using polluting fuels	Survey
% of targeted households using the project stove	Survey and/or stove use monitoring
Country or province/state	Project scope
Cookstove's lifetime	Manufacturer specification

HAPIT

Calculates relative risks and population attributable fractions for 5 diseases at each exposure level using integrated exposure response functions to determine attributable and then averted burden

OUTCOME

Estimate of ADALYs attributed to the project's intervention

BACKGROUND DATA

HAPIT Background Data	Source
Background disease data - deaths & DALYs	2013 Global Burden of Disease
Population data	2010 US Census International Bureau
Solid fuel use	WHO/Bonjour et al. 2013
GDP per capita	2013 Institute for Health Metrics and Evaluation

The ADALYs methodology outlines an approach for clean cooking projects to monitor the change in personal exposure to harmful pollutants, specifically particulate matter (PM2.5) to estimate the number of averted disability adjusted life years (ADALYs) using the Household Air Pollution Intervention Tool (HAPIT).[5]

The ADALYs Methodology requires a project to provide seven key inputs into HAPIT, as summarized in Figure 2. The project must first conduct baseline and biennial 48-hour personal exposure monitoring (PEM) of $PM_{2.5}$ with primary cooks in a sample of project households. PEM may be conducted through gravimetric or optical monitoring.[6] Surveys may then be used to determine the number of people per household and the percentage of population using polluting fuels and using the project stove. The project's location and the cookstove's operational lifetime must also be specified. From these inputs, HAPIT estimates ADALYs from ischemic heart disease, stroke, chronic obstructive pulmonary disease, lung cancer, and acute lower respiratory infection (for children under 5 years).

Assumptions, uncertainty, and limitations of HAPIT

The developers of the HAPIT never intended to provide research-quality epidemiological evidence, but instead meant to provide "'good enough' evidence based on the best available health effects information linked to air pollution exposures".[7] The HAPIT therefore makes several assumptions, including that the cook's exposure has a direct, adjusted-default relationship to other household members', that the scale of dissemination does not affect performance, that integrated exposure response curves reflect health impacts, and that the national background disease patterns remain constant over the period (max 5 years). It does not consider seasonality and secular variations,[8] and excludes upstream $PM_{2.5}$ exposure and assumes equal toxicity for all $PM_{2.5}$ components and mixtures. Conservatively, the methodology only calculates health benefits for five years (only crediting 80 percent of the expected total benefit), only includes $PM_{2.5}$[9], excludes ADALYS from other linked conditions, and assumes national incidences of the related diseases.

The ADALYs methodology ask projects to use the most recent version of HAPIT; however, even the most recent version (3.1.1 as 31 January 2023) is out of date in terms of background data and statistical methods. The researchers have instead created an entirely new tool: the Air Pollution Burden of Disease Explorer (ABODE). ABODE has more recent background data and asks for slightly more specific inputs (e.g., female, male, child, and ambient exposures), but still lags the most recent statistical techniques used in the latest Global Burden of Disease estimates.[10]

Uncertainty from Personal Exposure Monitoring

The ADALYs methodology acknowledges uncertainty regarding the use of optical monitoring estimates and the methodology requires an adjustment to correct bias.[11] However, regardless of monitoring technique, research has found that a 48-hour particulate matter measurement is rarely indicative of the long-term mean[12], particularly as stove stacking is seasonally dependent.[13] During the 48 hours of monitoring, the cook is extremely aware that she is being monitored, that baseline stove use is undesirable[14], and that the monitoring party advocate for the more efficient stove. Therefore, a single biennial PEM estimate is likely not indicative of exposure over the two years to which these results are applied.[15] Pillarisetti et al. 2023 advocate for monitoring longer than 48 hours or the use of repeat measurements.

Further, the ADALYS methodology allows projects to monitor drop-off through surveys or continuous stove monitors. There are several concerns with self-reported, cross-sectional surveys (social desirability, interview, and recall bias[16]). The methodology neither requires a specific survey nor provides specific recommendations to address these biases when carrying out the survey. Direct monitoring is the most robust method but is not required.

The concerns over the accuracy and/or conservativeness of the PEM is troubling as research has shown that traditional stove use must drastically decrease to see health benefits[17], and persistent stove stacking decreases the effectiveness of even the cleanest stove interventions.[18]

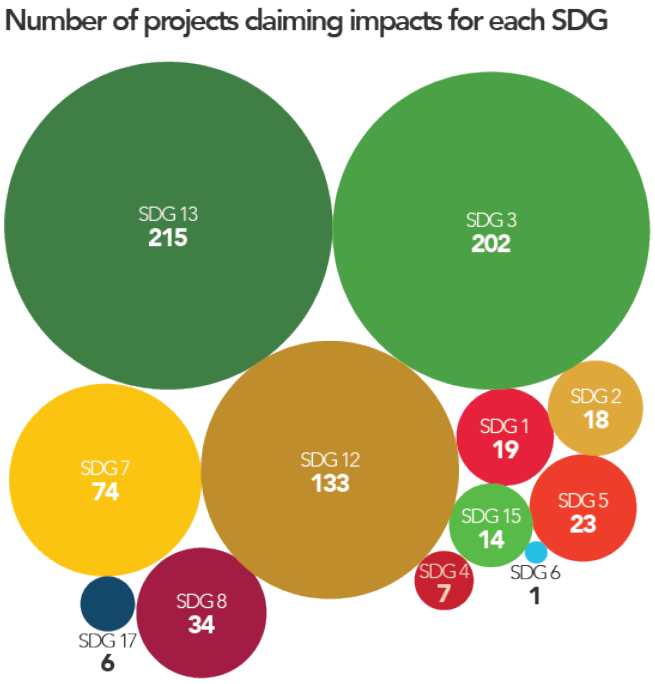
Contributions to SDG 3, SDG 12 and SDG 13 are the most commonly claimed SDG benefits

Our analysis of all clean cooking projects in Gold Standard registry shows that besides emission reductions resulting from project activities (SDG 13), the most claimed contributions by clean cooking projects are improved health (SDG 3), responsible production and consumption (SDG 12), and affordable and clean energy (SDG 7) (Figure 3). While Gold Standard certified projects are required to contribute at least three SDGs, they are encouraged to contribute to more.

It is therefore surprising to see only a few projects claiming benefits under SDG 15 (Life on land) despite clean cooking activities helping to address deforestation and forest degradation. Similarly, despite supporting women and girls who gain time and reduce hardship from collecting less wood for cooking, very few clean cooking activities claim contributions to SDG 5 (Gender equality).

However, the scale and quality of contributions to these SDGs vary across projects. Below we present findings from a deeper review of 20 clean cooking projects randomly selected from the Gold Standard registry.

Figure 3.Besides emission reductions (SDG 13), the most claimed contributions by clean cooking projects are improved health (SDG 3), responsible production and consumption (SDG 12) and affordable and clean energy (SDG 7).



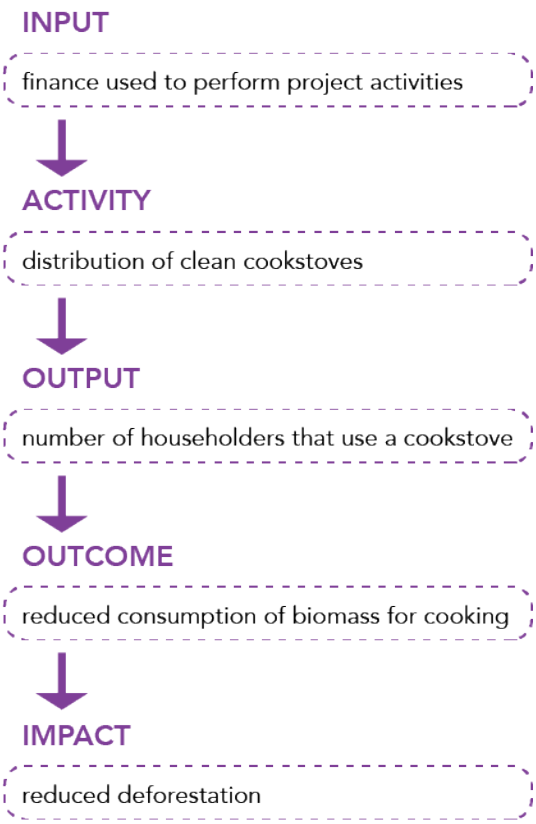
Source: Climate Focus analysis.

Few projects measure their SDG outcomes

Clean cooking activities can deliver long-term sustainable development impacts beyond enabling access to clean cooking technologies.

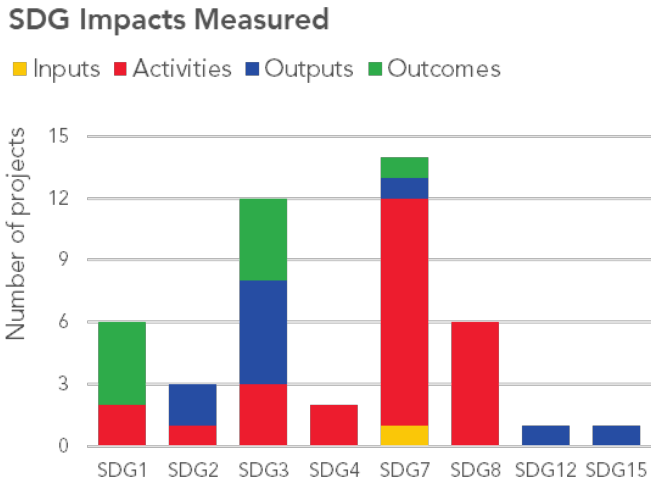
However, it is often difficult and resource intensive for a project to establish a causal chain from activity to an SDG impact (Figure 4). In most cases, it is relatively easy to monitor changes at the level of output while at outcome and impact levels, external factors influence whether the intended results can be achieved and are fully attributable to the project. And in some instances, it may be difficult to establish and quantify benefits where clear methodologies are not readily available.

Figure 4. An example of a project 's results chain.



Among the 20 assessed Gold Standard projects, most SDG benefits are measured at the activity level, i.e., number of cookstoves distributed (Figure 5). Few projects measured SDGs 1,3 and 7 at the outcome and impact levels, i.e., improved health and wellbeing of technology users. This is likely due to it being easier to simply monitor the activity being implemented, rather than its impacts. However, this does risk projects making assumptions about its impact that may not materialize. For example, a project may assume it yields health benefits by monitoring the number of stoves installed when in reality prevalent stove stacking may mean that health impacts are limited (Box 1).

Figure 5.Most SDGs benefits are measured at the activity level.



Projects generally use simple indicators to measure SDG impacts

An closer look at 20 projects and their most claimed SDGs reveal that projects generally use simple indicators that rely on one single datapoint (e.g., number of users) (Table 1). While such indicators are easier to measure and monitor, they are difficult to contextualize (i.e., how it relates to the situation in the community and the country).

Among the 20 assessed projects, surveys are the preferred method for monitoring SDG benefits (Table 1). Surveys are required under the Gold Standard to assess the emissions reductions, so it makes sense that projects would choose to simply add additional questions onto the survey that they would anyways have carried out. The general practice is to use survey staff to collect end-user data using a predesigned questionnaire with questions for predefined SDG monitoring indicators. To track SDG 8 (decent work and economic growth), employee records are often used too, and other internal sources of data are occasionally used. These data collection methods are considered valid under the SDG Impact Tool and widely used for SDG reporting beyond carbon projects.

Table 1. Approach to reporting SDG benefits of clean cooking projects.

SDG	MOST COMMON CLAIM	MOST COMMON INDICATORS	MOST COMMON MEANS OF MEASUREMENT
SDG1 No poverty	Reduced fuel expenses	Percentage of households confirming savings	Survey
SDG2 Zero hunger	Increased agricultural output	Percentage of households reporting bioslurry application to fields	Survey
SDG3 Good health and well-being	Indoor air quality	Percentage of households confirming reduced smoke while cooking	Survey
SDG4 Quality education	Training provided	Number of trainings delivered	Survey
SDG7 Affordability and clean energy	Access to affordable and clean energy services	Percentage of households reporting stove use	Survey
SDG8 Decent work and economic growth	Employment opportunities	Number of employees hired	Employee Records
SDG12 Responsible consumption and production	Reduced biomass consumption	Reported tonnes biomass saved per year	Survey
SDG15 Life on land	Reduced deforestation	Reported tonnes firewood saved per year	Survey

A CLOSER LOOK AT THE INTEGRITY OF SDG CLAIMS

Projects diverge in their approaches to SDG monitoring, affecting the reliability of the reported claim and complicating comparability

A closer look at the three most commonly claimed SDG benefits within the sample of 20 projects assessed – SDG 1, 3 and 7 – reveal that the approaches to monitoring SDG benefits vary significantly. This will be streamlined once Gold Standard registered projects shift to using the SDG Impact Tool at renewal of their crediting periods; but given this was only published in 2022 the existing pipeline of activities remain divergent in their approaches to SDG benefit monitoring.

SDG 1 – No Poverty

While several projects in our sample for this analysis claim to contribute to poverty alleviation among households using cookstoves, these claims are not always clearly linked to the project activities. Projects use different proxies and evidence to measure and monitor their contribution to SDG 1.

Of the six projects that document monitoring contributions towards SDG 1, four of them use "saving time and/or money" for participant households as a proxy for poverty alleviation, which they measure via a user survey; however, the survey questions vary, affecting the reliability of the final reported claim. Two of these projects asked participants to report how much money they save on fuel and use this to calculate total household savings. One project asked participants to report whether they believed they were saving time or money as a result of the distributed cookstoves; and another asks households

if their quality of life has improved compared with the baseline to estimate contribution to SDG 1.

Two other projects claim to contribute to SDG 1 by providing access to essential basic services in the form of energy for cooking/boiling water. This contribution is measured by one as the daily time spent cooking and by the other as the number of households reporting use of the stove. These constitute relatively distant measures of ultimate impact and require more assumptions to conclude that poverty is being reduced. These measurement approaches are broadly in line with the Gold Standard guidance, although application of the SDG Impact Tool will likely improve the monitoring and reporting of contributions to SDG 1. The SDG Impact Tool requires using "Average household savings i.e., decrease in expenditure on basic service such cooking, lighting, drinking" for SDG 1 by collecting data on household expenditure with the local currency or USD as the unit of measurement, which the projects have not done.

The SDG Impact Tool also stipulates that projects may measure the change in the number of households living below the poverty line as a result of project activities. However, no projects assessed applied such a method. The tool also does not give any specific guidance on how to go about monitoring such an indicator, as it does for those mentioned above.

SDG 3 – Health and Wellbeing

In reporting their contribution to health and wellbeing of their beneficiaries (SDG 3), projects relied on both simple and complex indicators. Six projects monitored the quantity of smoke in the kitchen while cooking as an indicator and another four tracked self-reported "improvements in health" or declines in specific symptoms, i.e., respiratory illness, coughing, headaches, and eye infections. While 'number of cookstoves in use' is a simple indicator and can be monitored using tools like survey, monitoring state of health is complex and requires additional information and more accurate measurement techniques for the reported information to be reliable. Two of these projects inferred improvements in health only by the reported use of cookstoves provided. These measurements are therefore far removed from the ultimate impact on health and require significant assumptions. The SDG Impact Tool outlines three suitable monitoring indicators for SDG 3: ADALYs (see Box 1), reduction in indoor air pollution and number of visits to the hospital for respiratory illness.

As more projects start to use the SDG Impact Tool, reporting on SDG 3 will likely improve as the Tool requires technical measurements of carbon monoxide and reporting of actual hospital visits. This may be considered a more robust estimate than those applied by projects.

SDG 7 – Affordable and Clean Energy

To monitor their contribution to affordable and clean energy (SDG 7), projects either simply estimated impact based on the number of stoves in active use or estimated the quantities of fuel saved, or the cost savings derived from stove use. The SDG Impact Tool allows measurement of total number of beneficiaries or total number of beneficiary households, and the total savings in energy, fuel or costs as a valid measures of SDG 7 impact. Given that such measurements are required for carbon mitigation estimates fundamental to the projects, it is unsurprising that so many report SDG 7 as a co-benefit.

The number of SDGs impacted is more important to buyers than the significance of the project's impact

Accruing and reporting SDG benefits continue to remain a secondary goal of carbon projects despite requirements under the Gold Standard to include contributions to at least two non-climate SDGs in the project design. This is largely due to lack of demand from financiers – including carbon credit buyers – for rigorously certified SDG benefits. Buyers are willing to pay more for credits that also yield non-carbon benefits; but are not too concerned with the scale, depth and longevity of these non-carbon impacts. Rigorous SDG monitoring is expensive and often requires specialized skills to implement and analyse data. For example, using the HAPIT/ADOBE to monitor indoor air pollution is not straightforward (Box 1), and the use of data loggers to track technology use often require expertise to interpret the data collected. These skills are not always available within project staff and may require hiring external support.

In addition, corporate buyers purchasing credits to compensate for their own emissions tend not to be interested in the depth of SDG impact but care more about the number of SDGs impacted. The same buyers tend to assume positive SDG impacts due to the nature of clean cooking and are not that interested in rigorous monitoring to substantiate SDG benefits. That being said, projects with high non-carbon benefits (e.g., household/community project types like clean cookstoves) are still sought after over other project types due to being able to meet both Environmental, Social and Governance (ESG) goals and climate targets.

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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

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ENDNOTES

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7 Pillarisetti, Mehta, Smith 2016 pg. 148

8 Ibid.

9 Inefficient stoves expose users to other combustion related pollutants. The GBD also does not include these.

10 HAPIT uses 2013 Global Burden of Disease, while ABODE uses 2017. However, there are more recent estimates available. HAPIT and ABODE use integrated exposure response curves, while the latest Global Burden of Disease estimates use MR-BRT curves. MR-BRT curves, unlike IER curves, use a spline function with three degrees of freedom rather than a power function and are not anchored to active tobacco smoking, but rather rely on cohort data from China.

11 If optical monitoring is used, the project must adjust the optical PEM estimate by the ratio of the means for gravimetric and optical monitoring.

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15 In the off year when a new PEM is not required, the methodology holds 40% of the ADALYs in reserve, until the next PEM and averages the two estimates for the interim year. This may be less conservative as baseline stove usage tends to increase over time (e.g., Hanna et al. 2016); however, this uncertainty is confounded with the fact that the single PEM estimate is likely not indicative of the long term mean anyway (Pillarisetti et al. 2023).

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